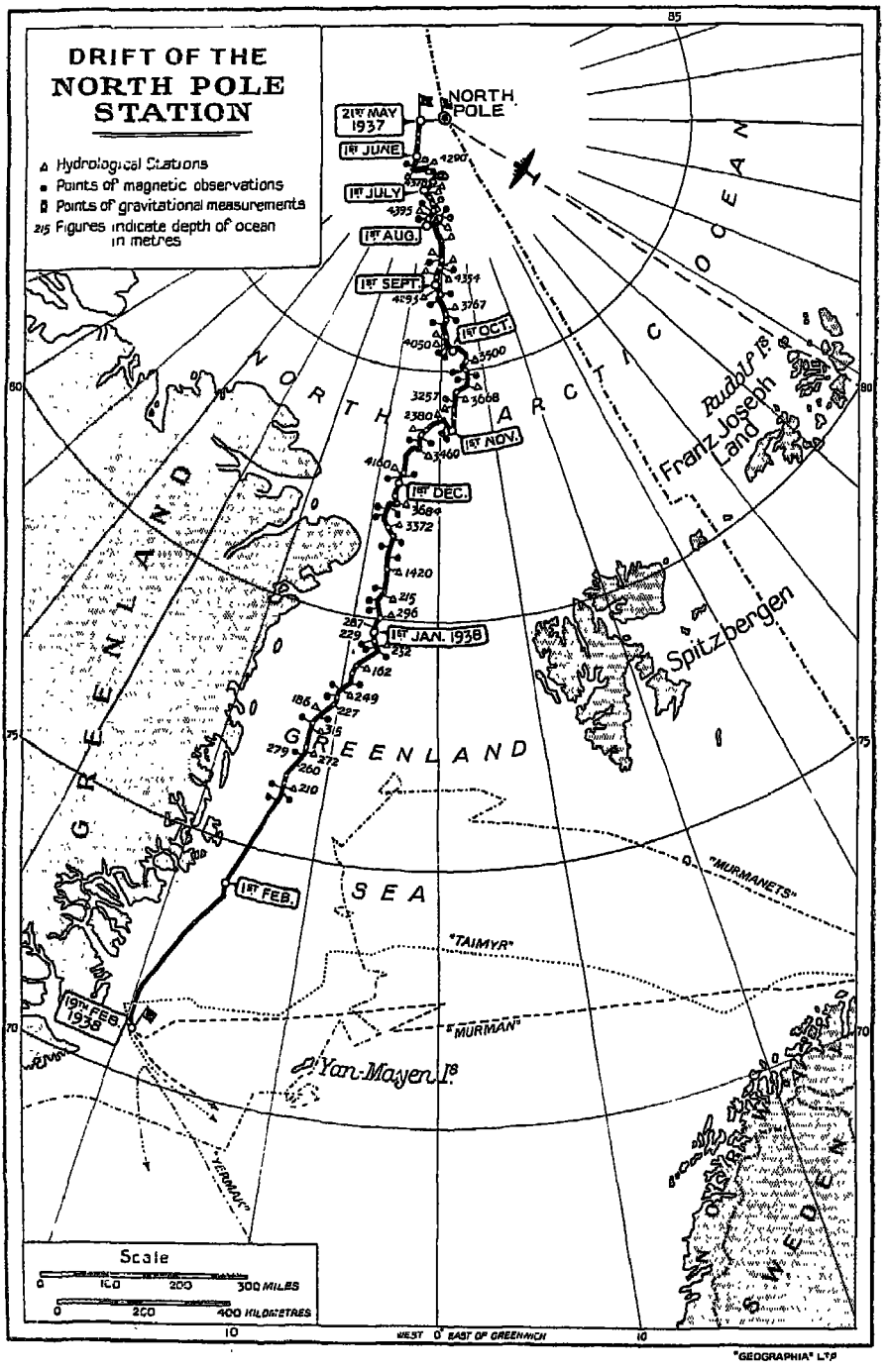
LIFE ON AN ICEFLOE


DRIFT OF THE
NORTH POLE
STATION
Hydrological Stations
Points of magnetic observations
Points of gravitational measurements
215 Figures indicate depth of ocean in metres
NORTH POLE
21ST MAY 1937
1ST JUNE
1ST JULY
1ST AUG.
1ST SEPT.
1ST OCT.
1ST NOV.
1ST DEC.
1ST JAN. 1938
1ST FEB.
19TH FEB. 1938
4290
4395
4354
4154
3767
4050
3500
3257
3068
2380
3460
4160
3689
3372
1420
215
296
287
229
252
162
249
186
227
315
279
272
260
210
NORTH POLAR OCEAN
GREENLAND SEA
GREENLAND
Rudolf Is.
Franz Joseph Land
Spitzbergen
"MURMANETS"
"TAIMYR"
"MURMAN"
Yan-Mayen I.s
"VERMAK"
NORWEGIAN SEA
Scale
0 100 200 300 MILES
0 200 400 KILOMETRES
85
80
75
70
10
WEST 0° EAST OF GREENWICH
"GEOGRAPHIA" L.T.D

LIFE ON AN ICEFLOE

by

IVAN PAPANIN

Translated from the Russian by
FANNY SMITHAM

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ABOUT THE AUTHOR OF THIS BOOK

THE leader of Soviet polar explorers, Ivan Dmitrievich Papanin, is one of the most popular personalities in the Soviet Union, both as a social worker and as a scientist. His life has been an eventful one. He had the good fortune to lead the greatest scientific expedition to the Arctic in history. His friends call him in fun "the master of the North Pole." Now Papanin is the head of the vast economic enterprise of the Northern Sea Route, and a rear-admiral of the Navy of the U.S.S.R.

In 1945 Ivan Papanin turned fifty. He was born in the South of Russia, in the town of Sevastopol in the Crimea. His childhood was spent in a modest little house in the homely quarter of workers and poor fisher folk.

In this part of Russia, at the principal base of the Black Sea Fleet, love for the sea and for daring adventures and voyages was handed down from generation to generation, from family to family. Papanin's family was no exception to this rule. Papanin's grandfather had been a seaman in the navy, and had died the death of the brave during the heroic defence of Sevastopol in 1855. His father had served in the navy for seven years and then became a seaman in the barges plying the Black Sea.

It is, therefore, not surprising that the sea should have been Papanin's best friend from early childhood.

Often he would go fishing with the grown-ups and return home with a good catch of mullets and gobies. He was a lively boy, enterprising beyond his years, the acknowledged leader among his playmates.

Vanya attended the elementary school, at that time the only educational institution in the Korabelni quarter. But he was unable to finish the course because his father could not afford the school fees. "My heart ached when I had to take Vanya away from school," said old Dmitri Papanin. "He was an intelligent boy and spoken well of by his teachers. . . ."

At the age of fourteen Papanin began his working life. He was apprenticed to a turner in the compass shop of the Sevastopol naval port. In a few years he became a skilled craftsman. When still a youth he was considered a good, efficient turner. In the engineering shops of Sevastopol and later at the Bekker shipyards in Reval (now Tallinn) Ivan Papanin repaired slow-going cargo transports, gunboats and fast torpedo boats. Then the world war broke into his life. In 1915, when he was called up, he returned to Sevastopol. The period of his active service was spent on his native sea.

From the very first days of the October Revolution of 1917 the naval rating, Ivan Papanin, entered the service of the Soviet Government.

At the end of the Civil War, Ivan Papanin was employed at the People's Commissariat of Posts and Telegraphs. While there he was offered an appointment in East Siberia. In faraway Yakutia, at the

Aldan goldfields, many hundreds of miles from the Trans-Siberian railway, a big radio station was being built. To that spot went Papanin with his wife, Galina Kirillovna, the devoted friend and companion of his life. The express which took them to the East rushed through dense forests, past mountains and steppes. In steppes and mountain valleys they saw new towns springing up, factories being built and roads being made. Building was going on everywhere. Wild beasts, alarmed by the roar of machinery and grating of saws, fled from the taiga farther and farther to the north.

The building of a radio station on the goldfield was no easy matter. In that remote spot they had to live as on a campaign. The nearest inhabited points could only be reached on horseback.

In a year Papanin returned to Moscow. A quiet apartment in a crooked little street of the old capital. All around—books, on the table, on shelves, in cupboards, in bookcases . . . He had much to learn. He had to make up for the years given up to the civil war and the taiga. It was not easy to master the fat volumes on geography, history, political economy, specific sciences! He became a student at the All-Union Planning Academy and studied hard and persistently. For all that Papanin would not stay put. In 1931 he found himself for the first time in the Arctic. He went out on the ice-breaker *Malygin* to Franz Josef Land as representative of the Commissariat of Posts and Telegraphs, and at Tikhaya Bay exchanged mail with the dirigible, *Graf Zeppelin*.

Papanin was attracted, nay captivated, by the Arctic. Returning from the expedition, he firmly resolved to devote the whole of his life to work in the Arctic. In that grim and little-known land there were so many unsolved problems, so much for an intelligent mind and capable hands to do. The Arctic became his secret dream.

Early in 1932 Papanin gave up his studies at the Planning Academy. Several months later he was already beyond the 80th parallel, at Franz Josef Land.

On a remote island of the Franz Josef Archipelago—Hooker Island—a polar observation station was being built. The personnel for this station was carefully selected. The only kind of men who could make good in the Arctic were industrious and persistent workers, men of strong character and iron will. Ivan Papanin answered these requirements.

The hardness and grimness of life and work in the Arctic was after his own heart. The constant state of alertness one had to be in, the struggle against a capricious and treacherous climate, the austere yet rational mode of life, the peculiar feeling of comradeship which added strength to this small group of Arctic workers, all pleased Papanin, because it was in keeping with his own character and inclinations.

On Hooker Island, Papanin and his friends created a model polar observatory and built a village. In the following Arctic navigation season, the icebreaker *Malygin* brought to Franz Josef Land building materials, furniture, equipment, stores of provisions and other supplies. The scientific personnel of the polar station, who had come out on the *Malygin*, consisted mostly of young men eager to conquer the Arctic. In Papanin they found a fearless explorer, a brilliant organiser whose

determination knew no bounds. "With a man like him, you wouldn't perish anywhere!" was their verdict.

It was amazing with what fantastic speed the polar station sprang up. An aerodrome was built, a hangar for aircraft, an electric power station; they installed a telephone system to connect up all the buildings, and put up a windmill. The personnel lived under comfortable conditions, with a library and a clubhouse, in which stood a mail-box bearing the laconic inscription: "Collection: once a year, when a steamer arrives from Archangel." Communication with the mainland was maintained by radio every day, when the results of the various scientific observations were transmitted.

On Franz Josef Land, Papanin became very friendly with Eugene Fedorov, a young scientist and colleague. Three years later Fedorov became one of Papanin's three companions to share the adventure of the world-famous "North Pole" scientific station on the drifting icefloe.

The scientific station on Tikhaya Bay became widely known. Newspapers wrote about it, commentators described it over the radio, polar scientists visiting Tikhaya Bay spoke about the station with enthusiasm.

About that time an important event took place in the Arctic. For the first time, the question had been raised on a nation-wide scale of opening up a Northern sea route to form a main waterway linking up the Atlantic, the Barents and the White Seas with the Pacific Ocean. And in 1932, on the initiative of Joseph Vissarionovich Stalin, an expedition on the icebreaker *Sibiryakov* set out from Archangel to the East. The icebreaker made the voyage through the Northern sea route to the Pacific Ocean in one navigation season, i.e., without having to winter in the Arctic. A year later, the voyage was repeated by the icebreaker *Chelyuskin*, which also reached Pacific waters, but was thrown back by the icedrift from the Bering Strait to the Chukotsk Sea, where she went under, crushed by the ice. The crew of the *Chelyuskin* and members of the expedition landed on the ice and were rescued by Soviet airmen who took them back to the mainland. The voyage of the *Chelyuskin* once more confirmed the feasibility of sailing from European ports to the Pacific Ocean by the shortest sea route through Arctic waters. Soon after the loss of the *Chelyuskin*, the icebreaker *Litke* set out from Vladivostok to the Arctic. She made the voyage through the Northern sea route in one navigation season, like the *Sibiryakov* and the *Chelyuskin*, only from the opposite direction—from east to west. The invasion of the polar ice had begun.

Ivan Papanin at that time was head of a group of scientific polar workers on Cape Chelyuskin, the northernmost extremity of the European continent. Coming from the Kara and Laptev Seas, the *Chelyuskin* passed the Arctic settlement situated on the shore of Vilkitzky Strait. On board the vessel as a member of the expedition was the young geologist, Peter Shirshov, and the well-known Arctic wireless operator, Ernst Krenkel, the two having made the same voyage on the *Sibiryakov* the year before. Standing on the shore and watching the *Chelyuskin* disappearing eastwards were Ivan Papanin and Eugene Fedorov, a

scientific worker on the Cape Chelyuskin station. Little did any of them think that life's paths would throw them together to make the famous "foursome" of the "North Pole" Station on the drifting icefloe.

Making the round (on skis) of his "possessions" on Cape Chelyuskin, Papanin one day saw an immense field of ice many years old. The gigantic icefloe was drifting with the current through the strait, crushing everything in its path and staggering the imagination by its force.

"What do you think, Eugene," Papanin asked Fedorov who was with him, "of putting a little house on a monster like that, and maybe drifting for a year or two?"

Maybe at that very moment a conversation like the following was taking place in the wardroom of the *Chelyuskin*:

"We've got dozens of polar stations on the coasts and on islands," says Mikhail Babushkin, the senior Russian Arctic pilot, addressing those present, among whom were Shirshov and Krenkel. "Why shouldn't we land on the North Pole, build a hotel and start taking tourists there?"

"A fantastic idea, worthy of H. G. Wells," someone interrupted the speaker's facetious remark.

A spate of questions followed:

"Would the ice hold?"

"What would be the price of a tourist's ticket?"

"What sort of guarantee should we get from the polar bears?"

Thus, in different parts of the Arctic, the idea was gradually maturing among Soviet polar workers of penetrating to the North Pole, yet little did they think that only three or four years separated them from the realisation of this alluring dream.

Papanin on Cape Chelyuskin began to work out a plan with great energy. He clearly saw the difficulties of an expedition to the North Pole. Not many explorers had managed to penetrate to the Central Arctic. Many ways had been tried of reaching the icefields of the Central Polar Basin—on foot, by dog teams, on ships frozen into the ice, in aircraft and submarines. . . .

Ivan Papanin on Cape Chelyuskin read numerous books on different expeditions to the North Pole, studying every detail in them. He filled a fat notebook with his comments on the subject. He was still unaware that also dreaming of conquering the North Pole was Mikhail Vodopyanov, the outstanding Russian Arctic airman, a Hero of the Soviet Union, one of those who had taken part in the rescue of the *Chelyuskin* personnel stranded on the ice. The conviction grew more and more on Papanin that it was possible to live on an icefloe and drift with it for a year, maybe two. The same conviction was expressed by the airman, Mikhail Vodopyanov. When they eventually met both had elaborated detailed plans for conquering the North Pole, with much in common between them.

In 1935 Papanin submitted his plan to the appropriate governmental departments. The idea of landing at the North Pole from the air and organising a scientific station on a drifting icefloe met with approval. The Government gave its consent to the organisation of the North Pole Station and preparations commenced.

The staff of the expedition was housed in a wing of a big building in a narrow street in the business part of Moscow. From these premises the future "master of the North Pole" was linked up with dozens of institutions, factories and works, commissioned to manufacture the necessary equipment, supplies and foodstuffs for the expedition. Engineers were working on the problem of minimising the weight and improving the qualities of scientific instruments and apparatus. The Institute of Engineers of Public Nutrition was preparing appetising concentrates of high calorific value.

During the course of the day Papanin had to see to a hundred things. He held conferences with constructors, workers and engineers who were preparing the equipment; he entered into every detail of the expedition. In the evenings he studied astronomy and navigation, the technique of radio communications and the art of cooking, the rudiments of medicine and the principles of meteorology. In conjunction with the other members of the expedition he invented new kinds of polar equipment, made changes in their personal outfits, and again and again carefully studied the experiences of Nansen, Amundsen, Scott and Shackleton. The preparation for the daring venture into the very heart of the North Arctic Ocean proceeded most successfully, and in the summer of 1936, Papanin declared everything to be ready.

He sailed from Archangel to the North on the icebreaker *Russanov*, in the holds of which was the equipment for the future North Pole Station. The *Russanov* arrived at Rudolf Island, the northernmost island of the Franz Josef Archipelago, at the 82nd parallel. Here Papanin established the principal base for the air expedition to the North Pole. On an ice hill on this island was constructed an aerodrome—the northernmost aerodrome on the terrestrial globe. From this spot a squadron of aircraft was to take off for the Central Polar Basin. A few weeks later Papanin returned to the mainland. The matter was out of his hands now and in those of the airmen.

The air expedition for the Pole took off from Moscow for Rudolf Island on March 21, 1937. Two months later, after a careful survey of the ice, carried out in numerous reconnaissance flights, the leading aircraft of the expedition, piloted by Mikhail Vodopyanov, took off from the ice aerodrome on Rudolf Island and flew away to the North. It was followed by three other four-engined aircraft.

At 11 a.m. the aircraft N-170 landed in the region of the North Pole. The landing had been made by Vodopyanov in a masterly manner.

Papanin kept a diary from the first day of his arrival on the icefloe. Day by day, he noted down anything that happened during the nine months of the drift. His diary, written in ordinary or indelible pencil, filled five fat notebooks. He recorded events in the diary no matter what the conditions, even when they were such, as in the latter part of the drift, when the lives of the four explorers were in great danger.

Papanin's diary gives a full account of life on the drifting icefloe.

The four conquerors of the North Pole—Ivan Papanin, Peter Shirshov, Eugene Fedorov and Ernst Krenkel—maintained contact with the

mainland by wireless during the whole course of their drift. They transmitted the results of their scientific observations to the mainland, and also gave an account of their unusual life on the icefloe. The mainland, in its turn, kept them supplied with news of events at home.

The four Papaninites, as the four inhabitants of the North Pole were called, never felt lonely. Their spirits were continually sustained by the numerous radiograms received from their compatriots, and the appreciation of their work expressed in messages from foreign countries. The four men spent 274 days on the drifting icefloe, during which period they covered the immense distance from the North Pole to the south latitudes of the Greenland Sea.

The whole world followed the daring adventure of Papanin and his colleagues. Neither polar storms, nor the dangerous rocks of Greenland, nor the cracks in the chaotically packed ice, nor the proximity of polar bears could discourage the four explorers of the Central Arctic. Papanin, Shirshov, Fedorov and Krenkel worked zealously and fruitfully to the last moment of their stay on the drifting icefloe.

Papanin's expedition contributed much new scientific data about the Central Arctic. It established the laws governing the drift currents; it studied the relief of the bed of a considerable part of the North Arctic Ocean; it proved the presence at the Pole of warm waters of Atlantic origin, which penetrate to the Arctic Ocean through the wide gate between Greenland and Spitzbergen; the magnetic measurements made by the expedition established the geographical distribution of the elements of terrestrial magnetism along the course of the drift. Meteorological observations showed that the weather is considerably calmer in the region of what is called "the cold polar cap" than on the borders of the Arctic Ocean.

On February 19, 1938, the icebreakers *Taimyr* and *Murman*, sent out by the Soviet Government, reached the icefloe to take off the four members of the expedition. For the first time in the nine months of the drift, the Papaninites found themselves among their own people—Arctic seamen, airmen and scientists. Papanin and his colleagues were chaired and embraced and tossed in the air. The "Master of the North Pole" could barely manage to distribute the souvenirs everyone wanted.

For the last time he made the round of the territory of the camp, with which so many memories were bound up. The icefloe had served the four explorers as a home from the North Pole to the 70th parallel; drifting in zigzags, it was carried by the current all the time to the south. On taking leave of the icefloe, Papanin ran up the flag of the Union of Soviet Socialist Republics on a pole fixed on a high pack of ice. "It will go on drifting through the sea until the icefloe melts away," he said. Papanin was the last to leave the icefloe.

That night another meeting took place in the Greenland Sea. Breaking through the fog were the searchlights of the *Yermak*, the oldest Russian icebreaker, which had sailed from Leningrad to take off the four Papaninites from the icefloe. When the *Yermak* drew alongside the *Taimyr* and the *Murman*, the four Papaninites boarded her.

The wireless station on the *Yermak* worked at more than full load. It received a flood of greetings from the homeland and transmitted tens of thousands of words for the newspapers. Papanin sent a warm-hearted reply to every greeting. "Thank you for remembering a countryman," he wrote to Sevastopol which had informed him that the Appolonovaya Balka, where he used to live, had been renamed after him. The inhabitants of the town of Alushta had given his name to the street he had passed through with his detachment of partisans in 1920. Meetings held all over the Soviet Union passed the resolution: "We will work as faithfully and heroically as the four Bolshevik scientists. . . . We will take lessons from the Papaninites in fortitude, courage and valour. . . ."

The wireless station received a message addressed to the "four" from Stalin and his colleagues:

> "To Papanin, Shirshov, Fedorov, Krenkel.
> We congratulate you on the successful fulfilment of your responsible task. The whole of our country is proud of your heroic work. We await your return to Moscow. Fraternal greetings!"

From the moment the Papaninites returned to their native land their life was like a triumphal procession. For two days they were fêted in Leningrad, and on March 17, 1938, a special train brought them to Moscow. A year had gone by since they left Moscow. They had flown away to the North believing in the success of their undertaking and their belief had been fully justified. Papanin and his comrades had left the capital as rank and file explorers and returned to it as world-famous conquerors of the North Pole, Heroes of the Soviet Union.

Soon after his return to Moscow the degree of Doctor of Geographical Sciences was conferred on Papanin. The Government appointed him Head of the Central Administration of the Northern Sea Route, which position he occupies to the present day.

In him the army of Soviet polar workers acquired a resolute commander. With great energy, Papanin set about the task entrusted to him by the Government of converting the Northern Sea Route into a main waterway to ensure regular communications with the Far East.

The network of polar and wireless stations was considerably extended; ports were equipped at the main sections of the route; air bases were established for systematic ice reconnaissance for the service of ships.

Every year during the Arctic navigation season, Papanin would sail away on an icebreaker to direct navigation along the Northern Sea Route. He would penetrate to the most distant corners of the Arctic, introducing order everywhere. He saw to it that the vast business of the Central Administration of the Northern Sea Route, with ramifications over thousands of kilometres, was extended and consolidated.

As a result of the constant encouragement given to Arctic exploration and development by the Soviet Government and particularly by Stalin, the face of the Arctic was changed; the country gradually became habitable and hospitable. The Arctic settlements are linked up with the mainland by dozens of ships plying the Northern Sea Route from west

to east and from east to west. Ore mines, coal mines and sawmills are operating in the Arctic; prospecting for oil has been carried out with success.

Another noteworthy feat performed by Papanin was to extricate the icebreaker *Georgi Sedov* from the ice in which she was trapped. When the four Papaninites, still drifting in their icefloe, were approaching the 84th parallel, the icebreaker *Georgi Sedov* began her drift in the Laptev Sea. The vessel had become icebound and, drifting with the ice, was carried more and more to the north and north-west, crossing hitherto unknown regions on the borders of the "pole of inaccessibility." On board the *Sedov* were fifteen rank and file polar explorers, most of them young. They converted the vessel into a scientific research station. Drifting with the ice the *Sedov* covered the immense distance from Novosibirsk islands to the Greenland Sea. The fifteen explorers aboard the vessel carried out a vast programme of scientific work. Their observations contributed much to the knowledge of Arctic scientists and elucidated many obscure phenomena in the Arctic Basin.

Coming to meet the drifting *Sedov* in the Greenland Sea was the flagship of the Arctic fleet, the *Joseph Stalin*, flying the pennant of the Head of the Central Administration of the Northern Sea Route. The *Joseph Stalin* was the latest and most modern icebreaker built at the Leningrad docks. In 1939 Papanin, on board the *Joseph Stalin*, led navigation in the Arctic; in a few weeks the icebreaker crossed the Northern Sea Route from Murmansk to the Pacific Ocean and back again. Now the *Stalin*, battling through the severest polar storms, was cutting through the ice of the Greenland Sea to reach the *Sedov*. This was accomplished on January 13, 1940, when the drift of the *Georgi Sedov*, which had lasted 812 days, was over.

The successful extrication of the *Sedov* from the ice was greatly appreciated by the Soviet Government, who awarded Papanin another "Golden Star." For the second time Papanin became a Hero of the Soviet Union.

When the Hitlerites attacked the Soviet Union, Papanin was preparing for the forthcoming Arctic navigation season. Plans had to be altered en route; measures had to be taken to safeguard Arctic communications for military needs; the icebreaker fleet had to be put on a war footing; the operations of the Northern Sea Route had to be reorganised to serve the needs of the front. Papanin worked day and night without rest.

The ships sailed from the ports at the appointed time. Provisions, machinery and equipment were delivered to their proper destinations. In the autumn the ships, as usual, returned to the mainland with cargoes of Igarsky timber, Arctic coal, fish and pelts.

The Soviet Union at that time was living through difficult days. Taking advantage of the unexpectedness of their treacherous attack, the German divisions were tearing madly into the depths of the country. The State Committee of Defence appointed Papanin plenipotentiary in all matters relating to transport in the North.

Papanin remained in Archangel and Murmansk almost without a

break for two years. But all the time he did not relinquish the direction of the important work proceeding along the Northern Sea Route. He availed himself of every opportunity of maintaining contact with the polar workers when they arrived at the port or on visits to Moscow, or by wireless. Every day Papanin directed the work of the many thousands of people scattered over the vast territory of the Soviet Arctic.

The summer of 1943 was marked by particularly complicated ice and meteorological conditions on the Northern Sea Route. Papanin sailed for the western sector of the Arctic to direct the convoys of ships.

Transferring from icebreaker to transport, from transport to battleship, from battleship to icebreaker, he visited many corners of the Arctic, casting a fatherly eye over the ports, polar stations and aircraft bases. On more than one occasion during this navigation season he was seen by the port workers of Providence Bay, Tixie Bay, the workers at Ugolni Bay and by the fishermen of Kolyma. He inspected the oil-bearing regions and salt-mines at Nordvik Bay and the wireless centre on Cape Schmidt; he verified the work of the polar station on Wrangel Island. From this place he brought away a polar bear cub, which he later handed over to an accompanying transport to be presented as a gift to the American city of Seattle.

In the autumn of 1944 Papanin returned to Moscow and got busy writing a report on the work in the Arctic. There were still many unsolved problems in this country of frozen silence. So much had been done by Soviet people to conquer the Arctic, so much still remained to be done before this vast region of cold would be finally won.

In spite of his great preoccupation with work of state importance, Papanin takes an active part in public life. He was elected by the people as deputy to the Supreme Soviet of the U.S.S.R., the Soviet parliament. He is also a deputy of the Moscow City Soviet and a deputy of the Chukotsk Regional Soviet. At the same time, Papanin is President of the Sports Section of the All-Union Society for Cultural Relations with Foreign Countries. In 1940 he was made an honorary member of the London Geographical Society.

In his capacity as deputy to the Supreme Soviet, Papanin receives numerous letters daily from different towns of the country. Not one of them remains unanswered; no request for help is refused.

Papanin loves children. He takes every opportunity to visit schools and likes to broadcast for children. On his initiative, polar workers have organised a system of patronage over children's homes, where war orphans are being educated.

Such is Ivan Dmitrievich Papanin, the man with a big heart and untiring energy, the famous son of the Russian people and author of the present book: "Life on an Icefloe."

FOREWORD

THE idea of organising an expedition in the Central Polar Basin on a drifting icefloe occurred to Arctic explorers during the "First International Polar Year" (in 1931–32). Great efforts and will-power, complicated technical appliances and thorough preparations were needed to plan and equip an expedition of this kind. In fact, it was the thorough, well-planned preparations which ensured the success of our work.

For a long time Russians had been attracted to the North. Our country has, on more than one occasion, fitted out expeditions to investigate the Arctic Ocean.

At the beginning of the twentieth century, D. I. Mendeleyev, the great Russian chemist, in collaboration with Admiral Makarov, worked out a plan for an expedition to the North Pole. In his memorandum to the Minister of Finance, Mendeleyev said: "the . . . conquest of the polar icefields with the aid of ships ought to be of greater interest to Russia than to any other country, for no other country possesses such an extensive coastline on the Arctic Ocean. Emptying into the Arctic are vast rivers irrigating a great part of the Empire, whose development is retarded not so much because of climatic conditions, as because of the absence of trading outlets through the Arctic Ocean. The conquest of the ice of the Arctic Ocean constitutes one of the economic problems of the future of North-East European Russia, and of practically the whole of Siberia."

The exploration of Franz Josef Land, where we chose a base for a further advance on the North Pole, has an interesting history. As long ago as 1870, the famous Russian meteorologist A. I. Voyeikov propounded a scheme for the organisation of a big expedition to explore the seas lying to the north-west of Novaya Zemlya. His plan was not realised.

One of the most ardent advocates of exploration in the Arctic was the geologist P. A. Kropotkin. In the memorandum which he drew up in connection with a projected expedition, Kropotkin pointed out, amongst other things, that between Spitzbergen and Novaya Zemlya there must be some undiscovered land stretching northwards beyond Spitzbergen. It was entirely by chance that the land to the extreme north of the Barents Sea, the existence of which had been presumed by Kropotkin, was discovered by an Austro-Hungarian expedition. In August 1873 the ship of this expedition became icebound, and was carried by the drifting ice to a land which Payer, head of the expedition, named "Franz Josef Land."

As reaching the North Pole was for long the chief object of Arctic expeditions, polar explorers were very interested in the land discovered by Payer. Of comparatively easy access to ships, and at the same time projecting far to the north, Franz Josef Land seemed particularly fitted as a base for an expedition whose object was to reach the North Pole.

At the end of the nineteenth century, working on Franz Josef Land

was an English expedition led by Jackson. Wintering in the northern part of Franz Josef Land at approximately the same time was the great Arctic explorer Fridtjof Nansen, who was returning south after his daring attempt to reach the Pole on foot over the drifting ice (Nansen reached Lat. 86°14′ N.). Soon the American journalist Wellman appeared on Franz Josef Land. He made a great deal of noise in the world press about his expedition to the North Pole, but the results achieved by his expedition were in inverse ratio to his advertising: Wellman got no farther than Rudolf Island. After Wellman's, another expedition appeared on Franz Josef Land, an Italian expedition headed by the Duke of the Abruzzi. This expedition established a base on the west coast of Rudolf Island, in Teplitz Bay, where the Bolsheviks in 1932 built the most northerly meteorological station in the world.

In the spring of 1900 a party of this Italian expedition, headed by Captain Cagni, set out from Rudolf Island for the Pole, their equipment and stores being pulled by one hundred and two dogs. Three months later, completely exhausted and worn out, the members of the polar party with several dogs, who had miraculously survived, returned to Teplitz Bay. Three of the party had perished. Suffering incredible hardships, Cagni succeeded in reaching Lat. 86°34′ N., i.e., penetrated twenty miles farther than Nansen in 1895. However, the Cagni expedition yielded no scientific results whatever.

A year after the Italians another expedition was operating on Franz Josef Land. This time it was composed of Americans, whose aim was to reach the Pole. The expedition was headed by the meteorologist Baldwin. They took with them four hundred and twenty dogs and fifteen horses. Baldwin, however, returned to America without even making the attempt to reach the North Pole. Another American—Fiala—who had taken part in Baldwin's expedition in the capacity of photographer, undertook to continue the work. After he had lost his ship, Fiala in 1903 established a base on Rudolf Island. Three times Fiala set out from the island with dog sledges in an attempt to reach the Pole, but the icepacks prevented him from getting beyond the 82nd parallel. Two years later an American rescue ship reached Franz Josef Land and took off Fiala and his companions.

What Cagni, Baldwin and Fiala were unable to accomplish, the Russian lieutenant G. Y. Sedov resolved to perform. In 1912 he decided to organise an expedition to the North Pole, with Franz Josef Land as his base. In a small vessel he reached Franz Josef Land and then set out on his daring venture on foot. The explorers had only twenty-four dogs who, with difficulty, pulled their miserable load distributed on three sledges. Sedov walked in front, his face pale, his movements hampered by asthma; from time to time he halted to rub his feet which were covered with patches of scurvy.

To Sedov the expedition was a question of life or death. To return home without having reached the Pole as his predecessors had done, was out of the question for him. He was mortally afraid of the ridicule he might encounter if he returned home from an unsuccessful expedition.

That is why, even though a sick man, Sedov would not renounce his daring project. On March 1, 1914, he made this last entry in his diary: "Dear sun, give them light at home so that they may see how hard it is for us here on the ice. . . ."

Four days later Sedov died, not far from Rudolf Island. Sedov's expedition carried out scientific work of no little importance, both on Franz Josef Land and on Novaya Zemlya, but the results of it were only published after the Soviets came into power.

I have referred in some detail to the history of men's attempts to reach the North Pole in order to show how important for polar explorations is the question of careful preparation and organisation. The Bolsheviks came to the North with well-thought-out plans and definite intentions. Our leader, Joseph Vissarionovich Stalin, gave the Soviet explorers a clear programme, that of mastering the Northern Sea Route and opening up the shortest possible maritime road to the Far East.

All endeavours and strivings and movements of Soviet polar explorers and all expeditions to the North Pole were subordinated to this basic idea.

I began to dream of the Arctic, of working in that grim, unknown territory, as soon as I changed over to peaceful life after many years spent at the various fronts during the Civil War. The opportunity to realise my dream did not present itself at once, not till 1931, in connection with the flight of the dirigible "Graf Zeppelin" to the North. I was placed in charge of the mail department of the Soviet icebreaker *Malygin*, which was to meet the "Graf Zeppelin" in the North and effect an exchange of mail. This meeting took place in Tikhaya Bay, Franz Josef Land.

For fourteen days the *Malygin* battled her way through the heavy, dangerous ice. This was my first acquaintance with the grim nature of the Arctic climate.

Very soon Tikhaya Bay assumed an inhabited appearance. We built a hangar for aeroplanes, a dwelling-house, a bath house, science pavilions.

Soon I was appointed the head of the base on Franz Josef Land at Tikhaya Bay. There were fourteen of us at the base. When, a few years later, I was entrusted with the preparations for the expedition on the drifting icefloe in the Central Polar Basin, I remembered my first experience of work in the Arctic—on Franz Josef Land and on Cape Chelyuskin—and began my preparations carefully, thinking things out to the last detail.

Facing me was not the ordinary work in the extreme north, when our expedition had a sufficiency of everything to hand; with equipment, food and instruments securely kept in storehouses, when another ten or fifteen tons of baggage could be delivered, and one could live a comfortable life. A drifting icefloe offers no such possibilities. We would have to live on "territory" which was continually moving, and to live on it for a considerable period of time. This was the premise upon which all our calculations were based.

Our Government insisted first of all that a reliable base for technical

equipment and stores should be set up in the area of the drift; without that it would be senseless to set out on so risky a venture. This base was established on Rudolf Island. I took a direct part in its organisation.

There are about one hundred islands in the Franz Josef archipelago. Latitudinally they stretch for practically four hundred kilometres, and longitudinally for nearly two hundred and fifty kilometres. The islands are separated by broad and narrow straits, which even in summer are usually blocked with ice.

Situated most favourably for flights to the Pole is Rudolf Island. It forms a large elevation of land almost on the 82nd parallel; from Rudolf Island to the Pole it is about nine hundred kilometres. It was no mere chance that Mikhail Vodopyanov, who explored the Franz Josef archipelago from the air, advocated the organisation of a base for aircraft on this very island. As I have already pointed out, most of the earlier expeditions which attempted to reach the Pole, also had their base on Rudolf Island.

Soviet polar scientists had made a thorough study of Franz Josef Land. In 1929 the first meteorological station was set up at Tikhaya Bay. Since then Soviet scientists have carried out systematic observations of the ice regime in the northern part of the Barents Sea and of meteorological phenomena in high latitudes. The station at Tikhaya Bay became an important scientific observatory in the Soviet North.

It so happened that Eugene Fedorov and I had worked for fifteen months at Tikhaya Bay in 1932–33. We witnessed and participated in the arduous and persistent work which Soviet scientists were carrying out in the Arctic. A comparatively small group of polar scientists were conducting aerological research, and making meteorological, geo-magnetic, biological and hydro-geological observations, as well as observations of radio waves and atmospheric electricity.

The first small polar station, with a staff of four men, was set up on Rudolf Island in 1932. However, a year later these four men were brought back to the mainland. From that time, until we began to prepare for our expedition, there was no one on the island, and the polar station was not used.

When drawing up the plan for the expedition to the North Pole and preparing the necessary bases, we decided to make use of Rudolf Island. We were greatly attracted by its convenient natural aerodromes and the nearness of the island to the Pole. This made it possible, in the event of a flight to the Pole, to take the maximum amount of equipment and provisions for our station on the drifting icefloe.

And so, on board the icebreaker *Russanov* was loaded the scientific equipment for our expedition; provisions which had been prepared in Moscow, fuel for the aeroplanes, oil for the engines, spare parts of all kinds, and building materials for the construction of the station on Rudolf Island.

Heavy ice, blocking the northern part of the Barents Sea and the straits between the islands of the Franz Josef Archipelago made the *Russanov's* progress very difficult. It was repeatedly necessary to make

detours in search of a channel. Twice we came close to Rudolf Island and were twice compelled to go back, as all the approaches were blocked with ice. Finally, at the third attempt we found a semblance of a bay in the extensive icefield adjoining the island. And here, with considerable difficulty, we succeeded in unloading our vessel.

Leaving carpenters and mechanics on Rudolf Island, we set sail for Tikhaya Bay, where the *Hertzen* which had already arrived in the Arctic, was moored. She had brought to Franz Josef Land the rest of the cargo required for building the base on Rudolf Island. Speedily transferring the cargo to the *Russanov's* holds, and filling her bunkers with coal, we once more set sail. Soon we were again before the familiar icefield adjoining Rudolf. Our tractors transported the new cargo on shore.

All this time the construction of the base on the island was proceeding at full blast. The members of the expedition and the *Russanov's* crew gave active assistance to the polar workers. In a short time two large dwelling houses were built on the grim and desolate shore of the island. Each house had eight rooms, a kitchen and a common room. On Rudolf Island were installed a 300-watt wireless station, a radio signalling tower (later of great help to the trans-polar flight of V. P. Chkalov and M. M. Gromov) and a garage. Regular wireless communication between the island and the future expedition on the drifting icefloe, as well as with the stations on the mainland, was thus assured. (During the period of the drift and our life on the icefloe all our communications, telegrams and newspaper articles were transmitted to Moscow through Rudolf Island).

Twenty-four persons were left to work on Rudolf Island. The whole of the time the men on Rudolf Island maintained regular communications with Moscow. They repaired and put into running order the tractors and "go everywhere cars," made the equipment for the aerodrome, put the electric power station into operation; they provided for everything, down to the smallest trifle.

Rudolf Island is completely covered with an age-old coat of ice. This ice shield goes right down to the sea at a steep angle. In the centre of the island are several ice-hills up to three hundred metres in height. The level tops of these hills form natural aerodromes. The men on the island turned these ice hills into good landing platforms for heavy multi-engined machines. Thus was organised a new, powerful polar station—the northernmost station in the world.

A whole village sprang into being on Rudolf Island—two dwelling-houses, a wireless station, a garage, a bath house, two store-houses for instruments and appliances, a provisions store, a livestock compound; in addition there were also a complete aerodrome with fuel stores, and a movable house which we shifted from place to place with the help of a tractor.

Rudolf Island became a reliable base for flights to the North Pole. The "cargo problem" was one that caused all of us considerable anxiety, and I would like to go into it a little more fully. In the first place we got down to selecting the tent in which we would have to live at the Pole.

After much argument and consultation we finally decided on the most suitable type for our future dwelling.

In preparing for the expedition our concern was to make all our equipment as light as possible. Our tent, including the bunks, weighed only fifty-three kilograms; its dimensions were: width—two and a half metres; length—three and seven-tenths metres; height—two metres. We made the tent very warm; it consisted of four layers. Between two layers of thick tarpaulin we put two layers of eiderdown. Attached to the tent was a screen to prevent the warmth escaping when the door was opened. The floor of the tent was inflatable, and the thickness of the air cushion separating the floor from the ice was fifteen centimetres. The bunks were fixed in two tiers, as in a railway sleeper. The framework of the tent was of duralumin pipes.

We took with us light and warm sleeping-bags made of wolf fur. The clothing was of deer-skin, our caps of wolverene, underwear of the best merino wool. We ourselves had to design the fashions for our clothes, and our aim was comfort and warmth. From our sketches and instructions the tailors produced a stock of clothing for us; on the icefloe we changed clothes approximately every two months. We also had various kinds of footwear. We had high waterproof boots, big heavy felt boots which could be pulled over the high boots, and fine strong thigh-boots of deerskin. We took with us a supply of eau-de-cologne, razor blades, toothbrushes—though we did not use these toothbrushes above three or four times during the two hundred and seventy-four days of the drift.

At the very outset of the preparations for the expedition the personnel of the North Pole Station was already decided upon; the personnel consisted of four men: Peter Shirshov and Eugene Fedorov, the scientific workers; wireless operator Krenkel, and myself.

The hydro-biologist Peter Shirshov, and the expert in magnetism and astronomer Eugene Fedorov, were known to me as industrious, able, daring, determined men, quite familiar with Arctic conditions. Despite their youth, these two Soviet scientists were no novices in the Arctic; they had participated in expeditions to the North and in the work of polar stations; hence their inclusion in the expedition on the drifting icefloe met with universal approval.

I was no less well acquainted with Ernst Krenkel—an untiring Arctic wireless operator, who had become world famous during expeditions to the Central Arctic Basin and in his work at polar scientific research stations.

I should like to give a more detailed account of my companions and friends, though their names and lives are now famous throughout the world.

Peter Petrovich Shirshov was born in Dniepropetrovsk, of a working-class family. Shirshov graduated from the Biological Faculty of the Dniepropetrovsk Institute of Public Education. He had concurrently taken a comprehensive course in the social sciences. He had worked in scientific institutions, specialising in hydro-biology. In the summer of 1930, Peter Shirshov found himself in the North for the first time,

accompanying an expedition to the Kola Peninsula. Later he went to Novaya Zemlya, and took part in the voyages of the *Sibiryakov* and the *Chelyuskin*. In 1935, he sailed with the icebreaker *Krassin* to the Sea of Chukotsk. The winter he was compelled to spend on the icebreaker *Chelyuskin* and the subsequent two months on the ice, hardened him and enriched his Arctic experience. It enabled him to make a careful study of life in the Arctic Sea during the winter months. No such study had ever been made before. His prolonged stay on the ice convinced Peter Shirshov of the possibility of working on a drifting icefloe in the central part of the Arctic, and he fully supported the organisation of such an enterprise.

Fears of all kinds that the movement of the ice would make it impossible to live and work quietly we considered to be exaggerated, and we who took part in the expedition on the drifting icefloe were very optimistic about its outcome.

The results of the scientific work on the *Sibiryakov*, the *Chelyuskin* and the *Krassin*, Shirshov combined into a single work on the seasonal changes in the composition of plankton caused by external conditions.

On his return from the voyage to the Sea of Chukotsk, Peter Shirshov began to prepare for the expedition to the North Pole. He had long entertained ambitions for such a drift. He knew that Nansen had suggested the idea of organising such an expedition. Nansen's idea was to use a dirigible and land on the ice in the Central Polar Basin a group of research workers supplied with all the necessary equipment. Nansen however, did not succeed in putting this idea into practice. The next to entertain it was Harald Sverdrup, who attempted to carry out a similar venture in 1932, but it proved a complete failure.

When choosing the personnel for the drifting North Pole Station, I knew that Peter Shirshov would be an ardent supporter of such an expedition, so without waiting for an official application from Shirshov, I included him in our foursome.

Eugene Konstantinovich Fedorov was the youngest of the inhabitants of the North Pole. He is an example of the young Soviet scientist. In 1927 he was admitted to the University of Leningrad. He selected geophysics as his speciality, later taking up terrestrial magnetism. Whilst he was still a student he worked on the magnetic survey of various parts of the Soviet Union, and headed a scientific research party to the North Urals. After graduating from the University he took up work in the Arctic. That was in 1932. He spent fifteen months working on Franz Josef Land, in Tikhaya Bay, where at the time I was head of the polar scientific research station. Eugene Fedorov had two duties entrusted to him in Tikhaya Bay—to look after the magnetic observatory and to carry out a magnetic survey of the archipelago.

Eugene Fedorov had never been to the North before. He did not even know how to harness the dogs. Yet almost immediately after his arrival in Tikhaya Bay he and a group of comrades had to set out on a march to try out the transport equipment of the polar station.

In the spring, big expeditions were undertaken in all parts of the archipelago. At that time no accurate map of Franz Josef Land existed.

The numerous expeditions which had been there had given descriptions of one or other part of it but had indicated the position of the different islands only approximately. During the big expeditions we organised, we carried out topographical surveys, corrected existing maps, and added to them all the newly discovered capes, bays and even entire islands. Federov marked many new magnetic points. In this way, working, hunting and taking photographs, he reached Rudolf Island, the northernmost island of the archipelago, where at that time there was a small polar station with a staff of four men.

In the spring of 1934, Eugene Fedorov accompanied me to Cape Chelyuskin. We spent the first month in frenzied building work. We built a dwelling-house, storehouses, a hut for magnetic observations for scientific work, a new wireless station, a mechanical workshop and a windmill. On Cape Chelyuskin we made the first real test in polar conditions of two "go-everywhere" machines. Their performance was perfect. Later, when organising the base on Rudolf Island, I included in the transport equipment my favourite automobile-tractor, the excellent "Stalinets."

There was plenty of work to do on Cape Chelyuskin. In addition to scientific observations, routine construction work and research connected with our expeditions, we spent a good deal of time in study for our own benefit. With the coming of the polar spring we undertook a number of expeditions to various parts of the Taimyr Peninsula. Eugene Fedorov was invariably a member of these expeditions, and one of his journeys, undertaken for the purpose of surveying the River Taimyr, lasted three months. He crossed the Taimyr Peninsula by dog-team. Fedorov determined the magnetic declination and marked numerous astronomical points.

In 1935 Eugene Fedorov returned to Leningrad and almost immediately began to prepare for the expedition to the North Pole. His suitability was unquestionable, and I included him in the personnel of the prospective expedition on the drifting icefloe as soon as its programme and plan were in the main approved by the Government of the U.S.S.R.

The wireless operator of our expedition, Ernst Theodorovich Krenkel, was born in Byelostok in 1903. As a child he was very fond of adventure stories. In the early years of the October Socialist Revolution, Ernst left school and started work in an engineering shop; he ground cutters for mincing machines; he acted as a bill-poster; he worked as a labourer in market gardens; he even contemplated becoming a film actor. In 1920 he heard by chance that a one-year course of training for wireless operators had been instituted, and he made application for admission. He was accepted. Krenkel showed great aptitude for this work and when he completed the course obtained employment in various wireless stations. One day he learned that a wireless operator was required on some island in the North. What island it was or where it was situated, Krenkel did not know, nor did he particularly care. The attraction for him was the unexplored places. This northern island turned out to be Novaya Zemlya. This was how he first came to the Arctic.

After working for a year at the station on Matochkin Shar he came to love the Arctic and was firmly resolved to spend the rest of his life working in the North. In 1927 Ernst Krenkel once more set out to work at the same station. Later he took part in the expedition which organised the first station on Franz Josef Land and spent the winter there. While working on Franz Josef Land he succeeded one day in establishing contact by wireless with the Antarctic. The incident, which occurred on January 12, 1930, found Ernst Krenkel speaking to the wireless operator of Admiral Byrd's American expedition in the Antarctic. In 1931 Ernst Krenkel participated in the Arctic flight of the dirigible "Graf Zeppellin." The dirigible flew via Leningrad and Archangel to Franz Josef Land, thence east, over Severnaya Zemlya, to Cape Chelyuskin, returning to Leningrad by way of Archangel.

The following year Ernst Krenkel took part in the historic voyage of the icebreaker *Sibiryakov*, which for the first time in Arctic history sailed from Archangel to Vladivostok in one navigation season by way of the Northern Sea Route. Later Krenkel took part in the voyage of the *Chelyuskin*. After the loss of the ship, he lived on an icefloe like the rest of the Chelyuskinites. In 1935 he was appointed head of a new polar station, which he himself had built on Cape Olovyanny (Severnaya Zemlya). The staff at this station consisted only of four men. In the spring Krenkel, together with mechanic Mekhrengin flew to Domashny Island where he reopened a polar station which had been closed down. Thanks to the initiative displayed by Ernst Theodorovich, a tiny group of Stakhanovite workers in polar regions consisting of four men, by pooling their specialities, managed to serve two polar stations for several months, thus over-fulfilling the plan for scientific work.

Ernst Krenkel was such a popular figure in the Arctic, among the polar workers, and throughout the Soviet Union generally, that when choosing a wireless operator for the expedition on the drifting icefloe, no better or more suitable candidate than he could be found. So Ernst Krenkel was included in the personnel of our expedition, and he got busy preparing for the responsible department of wireless communications.

Later, when working on the icefloe, I more than once had occasion to say how pleased I was with the personnel of our expedition. We lived in harmony, we were not fussy, we avoided unnecessary friction, and helped each other, as befitted men of the Soviet Union. Everybody of course has his weaknesses and his own individual peculiarities, but nothing hindered us from fulfilling the extensive programme of scientific work with which we had been entrusted by Soviet science, by the whole of our people, by our Party, our Government, and personally by Comrade Stalin.

During the preparations for the expedition we decided on the duties each was to perform. Peter Shirshov and Eugene Fedorov undertook to supervise the production of the scientific apparatus, Ernst Krenkel his wireless station, while I was to supervise the production of all the other equipment.

We had to take with us numerous scientific instruments for determining

the position of the icefloe, for sounding the depths of the ocean, for meteorological observations, for measuring the geographical distribution of terrestrial magnetism in the vicinity of the Pole, for measuring the force of gravity and other scientific observations. All these instruments we reckoned would have to weigh not more than half a ton altogether. In order to take as many instruments as possible, they had to be remade or constructed to new designs in order to achieve the minimum of weight. We laid in a store of all kinds of instruments, sufficient for an extensive and varied programme of scientific work.

We paid a great deal of attention to our wireless station. In the first place we had to think of the power with which to run it. We decided to take a wind motor. We commissioned a windmill, which was built to our designs by a special laboratory. Besides this we took with us a pedal and hand engine, what we called a "soldier-motor," constructed in the form of a bicycle. On days of calm, when the accumulators were run down and no wind was expected, power for the wireless station was generated by this engine which was worked either by foot or by hand. However, it was but rarely that we had to have recourse to this engine, as the polar winds did not forsake us.

Much time and care was required for the preparation of the food for the expedition on the drifting icefloe.

The root of all failures of most polar expeditions lies in inadequate preparation, primarily of the food supplies. So many expeditions have ended in disaster for this very reason, namely, shortage of foodstuffs.

Fridtjof Nansen, who drifted on the *Fram* in the Central Polar Basin, made long and careful preparations to provision his expedition. Nansen held that scurvy was the greatest source of danger in all polar expeditions. He therefore took on board the *Fram* supplies of tinned meats, varieties of tinned and dried fish, tinned and dried potatoes, tinned and dried fruits, jams and marmalades, sweetened and unsweetened condensed milk, compressed soups, Danish butter, Norwegian rye and wheaten bread, English ship's biscuits, various beverages, even beer.

Nansen held that scurvy was the result of poisoning. So everything he took with him was subjected to the most searching analysis. Two years after the *Fram* had sailed from Norway, Nansen, accompanied by his friend Johansen, left the ship to drift in the ice, while they made an attempt to penetrate as near as possible to the North Pole. They took provisions for a hundred days. Nansen failed in that attempt to reach the Pole. He spent nearly a year far away from the *Fram*, and had they not chanced to shoot a bear now and again, Nansen and his companion would have died of starvation.

We were preparing for our expedition forty years after the famous drift of the *Fram*, and in that time great headway had been made in the science of nutrition. The discovery of vitamins put a new face on the question of diet for polar explorers, particularly on the question of combating scurvy. We found products containing Vitamin C a useful prophylactic.

When preparing for our expedition we worked on the old scientific

assumption that there was no life at the Pole, no living creatures. Consequently we should not be able to rely on hunting to supplement our diet of fresh meat, which usually helps man to combat scurvy during a prolonged stay in the Arctic. Later, when we worked on the icefloe, where we encountered various representatives of the animal world in the Arctic Ocean, we realised that the conception of world science regarding the Arctic had been wrong, and that when preparing for an expedition the possibility of hunting in the Central Polar Basin should not be excluded.

The Institute of Engineers of Public Nutrition, which prepared our foodstuffs for us, aimed at the following :

That our normal diet should have a definite and fairly high calorific value. It should contain the basic nutritive substances necessary to the organism—albumen, fats and carbo-hydrates. That it should contain sufficient mineral salts and water. That our normal diet should contain all the necessary vitamins in sufficient quantities to prevent scurvy. That the food must be appetising and not disgusting, as sometimes happened in the Arctic. Moreover the food must be capable of retaining its nutritive values and its taste for the whole period of our drift, and withstand spoilage for a long time under all sorts of conditions, such as low temperatures and high humidity, usual in the Central Polar Basin. That it should be of minimum weight and volume ; and finally, that the preparation of meals in the conditions of life on the ice should not require much time and labour.

Having elaborated all these points jointly with the experts of the Institute of Engineers of Public Nutrition, we set about preparing a list of products we should require to take with us on our expedition to the North Pole. We were fully aware that to a considerable extent the success of our expedition would depend upon the rational selection of suitable foodstuffs.

John Franklin, the well known polar explorer, describing his voyage to the Arctic, says : "During the whole of our voyage we felt that no amount of clothing could warm us as long as we were hungry. But on those occasions that we were able to go to bed on a full stomach we spent the night feeling warm and comfortable."

It was for this reason that the Institute of Engineers of Public Nutrition, to whom the preparation of our provisions was entrusted, paid such great attention to every detail concerned with the "satisfactory feeding" of our expedition.

Half of all the provisions we took to the North Pole consisted of concentrates. Generally speaking, concentrates are food products, the weight and volume of which have been reduced by dehydration—drying or other processes. The idea of taking concentrates was no innovation. In ancient times, for instance, the North American Indians would cut meat into strips and dry it in the sun. The product thus obtained they called "pemmican" ; this name has been given to a product often taken on polar expeditions to this day. The drying of meat, fish, vegetables and fruits has been developed in many countries—both southern and

northern. Sometimes the drying is combined with pressing, which still further reduces the volume of the product. In what does the advantage of this method of treating food products consist? In addition to the fact that the cost of transport is less and the transport itself easier, the products keep much better in that form.

Fridtjof Nansen said that since on journeys the weight of stores has to be carefully considered, it is out of the question to take provisions other than those that have been carefully dried, thus reducing their weight to a minimum.

The list of products we prepared to take on our expedition on the drifting ice contained forty-six nomenclatures. Besides concentrates which were specially prepared, the assortment included also products which had had no special treatment other than drying and pressing (to reduce the amount of moisture they contained).

All the products were packed in special soldered tin containers; the contents of each tin was calculated to last four men for ten days Each tin contained: 1,470 grammes of pressed caviare; 1,430 grammes of condensed milk; 150 grammes of tomato paste; 2,500 grammes of butter; 2,500 grammes of fat bacon; 1,250 grammes of smoked streaky bacon; 1,250 grammes of pork sausages; 1,000 grammes of processed cheese; 1,250 grammes of rice; 500 grammes of green peas; 500 grammes of white flour; 93 grammes of potato flour; 100 grammes of vermicelli pudding; 800 grammes of dried fruit salad; 500 grammes of powdered potato; 2,000 grammes of cube sugar; 300 grammes of salt; 100 grammes of rusks; 120 grammes of dried onions; 700 grammes of pea soup; 240 grammes of barley soup; 360 grammes of borshch (a national Russian soup made of beetroots); 360 grammes of fresh cabbage soup; 1,250 grammes of meat rissoles; 1,250 grammes of chicken rissoles; 960 grammes of powdered chicken meat; 1,500 grammes of powdered meat; 300 grammes of meat (in pieces); 1,000 grammes of powdered milk; 1,000 grammes of egg powder; 1,250 grammes of chocolate with powdered chicken meat; 1,250 grammes of slab chocolate "Zolotoy Yarlik" (Gold Label) brand; 600 grammes of cranberry and black currant jelly; 125 grammes of tea; 500 grammes of cocoa; 250 grammes of coffee; 125 grammes of cranberry juice; 15 grammes of ground pepper; 15 grammes of peppercorns; 2 grammes of bay leaves; 300 grammes of sweets containing Vitamin C; 125 grammes of wild strawberries; 5 grammes of citric acid; 2,500 grammes of rusks containing meat.

Each tin weighed 43 kilogrammes. We took one hundred and thirty-five of these tins with us on the expedition. Of this number we left sixty-five as reserves on Rudolf Island. In addition, we took the following products with us: dried mushrooms, brandy, butter, Vitamin C tablets, essence of vinegar, tobacco, onions, garlic, methylated spirit, matches. (But when setting out for the Pole the airmen forgot to pick up most of these products). Further, we considered the question of packing. We achieved the best results by combining different kinds of packing materials (cellophane and tin-foil, or greaseproof paper and

tinfoil), calculated to keep the products in a good state of preservation without increasing their weight. We gave special consideration to the order in which the products were packed in the tins. Each product was given an ordinal number. We decided to group and pack everything in such a way that the smell of one product could not possibly penetrate to another.

We were faced with yet another difficulty, that of preserving all these products for a year on Rudolf Island. As I have already mentioned, all the equipment and provisions for the North Pole Station were brought to Rudolf Island by the icebreaker *Russanov* about a year before we started out by aeroplane from Moscow. However, this aspect of the matter was also handled efficiently by the Institute of Engineers of Public Nutrition. And to the honour of the workers of the Institute, we may say that no case of spoilage was discovered in any of the tins during the period of the drift.

Our main food at the Pole consisted of concentrates. The speed and ease with which these were prepared, so that we were able to obtain a hot and tasty meal without great expenditure of time or labour, was very soon appreciated. Not only were we able to have a proper dinner every day, but on holidays we were able to arrange a regular feast, at which ham, cheese, caviare, butter, condensed milk, sweets, and cake appeared on the table; on such occasions we even treated ourselves to a glass of brandy each.

Before we built our ice kitchen, we had our meals in a pink silk tent. I cannot say that this was very comfortable. We had to keep the dishes on our laps, as we ourselves filled up the whole tent. When the permanent ice kitchen was built we ate in more spacious and comfortable surroundings.

All the food was cooked on two primus stoves. But these were not ordinary primus stoves. In the first place, they had tanks which could hold as much as twelve litres of fuel. This made it unnecessary to refill with paraffin every day. We had foreign as well as Soviet primus stoves, but we found the home-made—Tula—product to be the best. All the kitchen utensils were made of aluminium and plastic. In their manufacture, the principles observed were: lightness of weight, smallness of volume and great durability. To save space, the saucepans, frying-pans, cups and mugs were so designed that one article fitted into another. The spoons were of aluminium, but we also had some wooden spoons.

After the food had been removed from the hermetically sealed tin it was placed in two plywood cases. The smoke soon turned these cases into "ebony". For furniture we used the overturned tins. In addition, we had a plywood table in the kitchen.

We had considerable difficulty in obtaining hot water in sufficient quantities. In the summer, before the frosts set in, we had more water than we wanted; streams rushed past the door of our living tent. But after the frosts set in, it became a serious problem to obtain water. We tried to save every drop of water we could.

To prepare a dinner we had first of all to melt some snow, turn it

into water, bring it to the boil; it was only after that that we could dissolve the concentrates and make borshch and rissoles. Dinner usually took three hours to prepare, but as a compensation, during the whole of the nine months of our drift in the Central Polar Basin, we were able to have hot, well cooked meals.

We brought with us to the icefloe various articles of ordinary use: fuel in rubber drums; a well-stocked medicine chest; notebooks for making notes and keeping diaries; lighters; a set of aluminium pots and pans; spades, picks, axes, crowbars, rifles, blow-lamps, plywood, soap, towels, sheets, tables, chairs, knives, scissors, razors, sledges, canoes, chess-men, stationery. We took a small library with us, which included works by Lenin, Stalin, Chernyshevsky, Gorky, Tolstoy, Balzac, Stendhal, Dreiser.

Our clothing consisted of silk and woollen underwear; woollen suits, socks, stockings made of dogskin, long fur boots reaching up to the thighs, felt top boots with goloshes, fur trousers and shirts made of fur skins; fur caps with ear-flaps; woollen mittens and fur mittens with gauntlets; woollen and down overall-suits; leather high-boots, leather coats, tarpaulin coats, hooded deerskin coats. We were furnished with sleeping-bags of wolfskins, and eiderdown sleeping-bags covered with silk. Besides this we took with us knapsacks, small sledges built to special design, two rubber clipper boats, two canoes, and rubberised tents.

All this equipment was taken to Rudolf Island by the icebreaker *Russanov*. A year later, the whole world heard the news of the landing of four Soviet multi-engined aircraft on the drifting icefloe at the North Pole.

Before setting out on our expedition we underwent an intensive course of training. We pitched our tent not far from Moscow, in a snow-covered field just off the Kaluga highway, living in it just as we would among the icepacks. It was a sort of "dress rehearsal" to show us in how far we had been successful in the selection of our equipment, how capable we were of preparing our food, whether our tent would retain the warmth, and how well the scientific instruments functioned. We tested all our equipment. We put up the wireless station and the windmill which supplied the power for the accumulators. We spent seven days in our tent, inuring ourselves to these strange surroundings, adapting ourselves to life in new conditions. Here we tested the wireless apparatus; from this tent, whose existence was known to very few, we contacted wireless amateurs in Kazan, Odessa, Kharkov, Tbilisi. The amateurs knew they were speaking to Krenkel, but they thought he was in Moscow. They did not suspect that they were assisting in the try-out of apparatus which would soon be installed at the North Pole.

This dress rehearsal convinced us still more conclusively that the preparations for life on the drifting icefloe were complete, that we had foreseen everything, that the equipment, the food, the stores, the wireless station, the scientific instruments—everything produced by our country—worked without a hitch. After this dress rehearsal, which lasted a week, we collected all our equipment and returned to Moscow.

A new phase in the preparations for the expedition had begun, a phase which can only be described as patience. We had to wait patiently for flying weather, and were ready at a moment's notice to fly out from the Capital to the North.

Something may be said about the conclusions we drew from our experience of life on the icefloe. We are now better able to say to what extent our preparations had been satisfactory and our equipment efficient. Certain lessons may be learned from our experience which would be of use to our workers in polar regions and to future polar expeditions.

There are two opinions as to what kind of tent is required for life in the Arctic. The well known American explorer Viljamur Stefansson holds that the most convenient is one that has air insulation. Hubert Wilkins, another American explorer, considers down insulation to be the best for the Arctic. Our drift on the icefloe has made it clear to us that what is required is a triple-layer insulation tent of the type that we had at the North Pole. That is to say, what is needed is a combination of down, air insulation and fur.

We had in our tent, as has been said, paraffin lamps instead of stoves. It can definitely be said that these lamps are not suitable and in future they should be replaced by paraffin stoves with chimneys. The fumes from paraffin lamps vitiate the air in the tent and after a time breathing becomes difficult. After a tiring working day it is hard to have to stay in a tent with no fresh air. Of course, a chimney could have been fixed up in the tent, but we had not provided for this. We had with us also tents in which we worked. These were made of silk and of linen. We soon learned that the silk tents were unsuitable for the Arctic, for they tear quickly in the wind; tents of thin tarpaulin we consider to be the best.

We used so-called snow buildings on the icefloe. They were constructed of bricks made of snow mixed with water. All the huts built of these bricks turned out to be very strong and served us well.

As regards clothing we had an insufficient supply of light-weight overall suits. In the blizzards we had to wear hooded deerskin coats which are most cumbersome. In the summer we wore high boots, and in the winter we wore big felt high boots. When we went out on long trips we put on our deerskin thigh boots and mountain skiing shoes.

The small sledges, on the designing of which we had spent considerable labour, turned out to be particularly successful. They lasted us throughout the whole of the drift, and carried heavy loads. All our equipment was loaded on to them when our icefloe broke.

We must refer especially to the question of hunting and shooting about which opinions differ. Nansen held that it was impossible to live in the Central Polar Basin by hunting, as there were no animals in the Central Arctic. Stefansson, on the other hand, maintained that the Arctic is hospitable and it is possible to live there by hunting alone. We came to the conclusion that it would be very difficult to exist in the Arctic on the produce of hunting alone. Hunting would take up too

much time and make it impossible to engage in the main occupation of scientific research.

The only failure we had, and rather an annoying one, was in photography. We had with us "F.E.D.," Leica and Contax cameras. Besides this we had a cine-camera. We decided to postpone taking photographs till the end of the polar night, when the work would be easier and we should have become familiar with the surroundings. Unfortunately, towards the end of the polar night our icefloe let us down, and we had to leave the Sea of Greenland without having completed our filming work. Nevertheless we brought back with us a great many photographs, and a film which was of very good quality. Soon after our return to the continent, Soviet cinema-goers were seeing a picture made from shots we had taken during our life on the drifting icefloe.

The foregoing are the conclusions we drew respecting the equipment we used on the expedition. On the whole, it had proved satisfactory; it had been well thought out and we believe that if we had to prepare for another expedition of the same kind, there is very little of the equipment that we would alter.

In accordance with the will of the Bolshevik Party, the Soviet Government and Comrade Stalin himself, Soviet scientists and polar explorers completed an expedition on a drifting icefloe which has upset the old conceptions of the Arctic. The success of this expedition was no accident. It was the result of thorough, painstaking preparation in which every eventuality and caprice of the Arctic was taken into account.

Soviet citizens and, indeed, people throughout the world, when they read of the flight to the Pole and life on the icefloe, hardly imagined what tremendous preparations had gone into this expedition.

What induced us to fly to the Pole? Our objective was not merely to reach the North Pole. The Pole had been reached before us. Moreover, a mere visit to the Pole would have yielded neither scientific nor practical results. Soviet polar explorers had opened a determined and methodical offensive against the Arctic. Year by year, they penetrated farther and farther to the north. The time had come when the North Pole became necessary to us, when it was extremely important to have information on the Central Arctic. This is why it was decided not only to reach the Pole, but also to conquer it, to compel it to serve science and progress.

Difficulties and obstacles lay ahead of us, but the chief difficulty was not the forbidding climate of the Arctic. It was not the Arctic that stood as an ice barrier before the explorers of unknown latitudes. The barrier was the assumption deterring many explorers that aeroplanes could not land on the ice of the North Pole. There was a tradition that the Pole was a barren waste, with neither beast nor bird, no living organism in the ocean, and where there was nothing for the scientist to do. Geography in a number of countries was reconciled to the "white gap" at "the top of the world." Those who attempted to penetrate to these parts, not for sensation-making records but for scientific work, were regarded as madmen. But we did not falter in the face of this barrier.

It was with profound emotion that we listened to the appreciation

of our work pronounced by the greatest man of modern times, our teacher, leader and inspirer, Comrade Stalin, when he spoke on May 17, 1938, at the reception in the Kremlin to representatives of the Higher Schools and Universities. In his remarkable speech Comrade Stalin said that in our practical work on the drifting icefloe we had upset the old idea about the Arctic and created a new one conforming to the actual needs of science.

We set out for the Far North with the confidence that had been instilled in us by the Party of Lenin and Stalin. We were confident of our strength and knew that standing behind us was the whole of our beloved Motherland, that with us was our dear Stalin, who would not forsake us in a difficult moment.

And now, reconstructing in our memories all the details of the preparatory period of our expedition, it is pleasant to realise that all our plans have been carried out; that we, four ordinary Soviet citizens, have justified the hopes placed in us by our Party, our people, our Government, by our beloved Stalin, who reared us and on whose initiative our Motherland has acquired a new water route linking up the west and east of the Union of Soviet Socialist Republics.

I. D. PAPANIN,
Hero of the Soviet Union.

Moscow, 1940.

MAY

May 21. At 11 a.m. the four-engined aeroplane N170 landed in the vicinity of the North Pole. Vodopyanov landed the heavy plane on the ice beautifully. It is difficult to convey the joy we felt as we exchanged impressions and congratulated each other on our arrival. The icefloe on which we landed is situated approximately twenty kilometres beyond the Pole, on the far side, and a little to the west of the Rudolf Island meridian. We straightway got down to the job of setting up the expedition's wireless station. We put up the mast and pitched a tent for Krenkel, another for our living quarters and a temporary tent for hydrological work.

The icefloe seems quite suitable for the organisation of a scientific station. An excellent aerodrome can be made here for the landing of the remaining planes.

In the first stages of any work not everything goes smoothly. Our accumulators have run down and Krenkel is impatient. It was ten and a half hours after our landing at the Pole before we contacted Rudolf Island and gave them news of ourselves. The first report of our safe arrival was sent off to the heads of the Government.

We have received the first radiogram from Rudolf Island, from the comrades we left behind us. They congratulated us on our successful arrival and wished they were with us.

The day has been so full of excitement, cares and worry that I haven't the energy to write any more now.

May 22. Krenkel and I got no sleep at all; we got the wireless station working and the motor for charging the accumulators. The others slept a little in snatches. We continued our job fixing up the camp. We've put up the tents for the kitchen, a store-place for the knapsacks, the instruments and all the other little things we would have to use. Our camp has quite an imposing appearance now, with its five tents, and two masts for the radio station with the aerial stretched between them. We also put up a box for meteorological observations and a theodolite to observe the height of the sun and determine the position of our drifting station. We must be quite sure, at all times, in what direction the drift is carrying our icefloe. It gives us a feeling of pleasure to know that every observation we make, every peculiar phenomenon we note in the Central Polar Basin, will be of service to our country and to science.

The weather is bad, with ground wind, but the sun peeped out from behind the clouds for a little, and Fedorov managed to make some astronomical observations. Eugene has had some wonderful news—his folks have informed him of the birth of his son. The young father is somewhat excited and embarrassed. We all vie with one another in congratulating him.

We've cut out bricks from the snow, and put up walls around the tents to keep out the draughts.

Moscow has informed us that our articles have appeared in *Pravda*. It makes us feel that at home they are really interested in us, thinking of us, waiting eagerly for our radiograms about our work and life at the Pole. Ernst simply can't keep pace with the greetings that come pouring in.

May 23. I decided while there were still free hands to spare to test the thickness and firmness of the ice. Is it strong enough for us to live on? We have started cutting a hole in the ice. We spent the whole of the day on the job. I made a bet with Shirshov that our icefloe was at least three metres thick.

While we were busy working Krenkel received a radiogram from the Kremlin, from Comrade Stalin. All thirteen members of the expedition were gathered together, and commented on the interest Joseph Vissarionovich Stalin was showing in our Polar expedition. Delighted and encouraged we decided that we must send an answer. This was our reply: "There is no greater happiness, Joseph Vissarionovich, than to be in our own sphere the executors of your great ideas; there can be no greater joy and pride, dear leader and teacher, than to receive your approval."

Peter measured the depth of the hole we had cut till he reached water. The thickness of the ice turned out to be three metres and ten centimetres. Hurrah, we'll be able to live on it. I was right, and Shirshov had lost the bet. . . .

We are all touched by the hearty congratulations sent by V. L. Komarov, president of the Academy of Sciences of the U.S.S.R. He calls us "courageous explorers, who for the first time in the history of world science are making a geographical and geo-physical study of the North Pole."

The weather has grown worse. The sun has disappeared and a blizzard has set in.

May 24. Ernst has received a radiogram from Rudolf Island, sent from Moscow: "I have learned with joy and emotion of the heroic landing at the North Pole by our wonderful airmen. Please accept congratulations from the great-grand-daughter of the first polar explorer, Vitus Bering."

What intense happiness news from the homeland gives us, and how it strengthens our will to work! . . . Everything is still before us, and there is so much to do.

We simply can't carry on working in these conditions any longer, without our main living tent. For the time being, we have decided to put up a snow hut to house our radio station and machinery department.

As soon as the sun appears Eugene makes his astronomical observations. Unfortunately, the weather is quite bad, ground wind and gale. Our icefloe is drifting at a speed of about half a mile an hour. At this rate we are covering over 20 kilometres a day.

May 25. We have received a radiogram from the Moscow correspondent of the *New York Times*. He says: "America is displaying tremendous interest in the remarkable flight and the organisation of a permanent scientific base at the North Pole."

Since the morning the weather has been exceptionally fine. The sky is clear, without a cloud, the sun so dazzling that we have had to put on our snow-glasses. The aeroplane R5 took off from Rudolf Island for reconnaissance. We are fortifying ourselves with patience, something we are clearly short of. Our position as regards the wireless station is critical, as we don't want to drive the engine uninterruptedly, and the windmill which is to supply power is on Molokov's plane.

Suddenly Krenkel dashed up and made us all happy with the news:

"The aeroplanes took off from Rudolf Island at 23 hours 5 minutes and are flying towards us. . . ."

The strain of waiting was intense. By now we ought to have sighted the planes, but there was still no sign of them. Taking our field-glasses, we scattered in different directions. Mark Troyanovsky—our cameraman—and I climbed one of the towering ice-packs. Someone else climbed on to the wing of the plane. Babushkin was the first to sight the plane flying towards us.

"There she is!" he shouted, pointing with outstretched hand.

Then we too spotted the longed-for plane in the sky.

"Molokov!" yelled out one of the boys. And so it was, our good old comrade Vasily Sergeyevich

In a few minutes Molokov's machine was overhead and soon it landed on the floe. We surrounded Vasily Sergeyevich and his companion and nearly hugged them to death.

We now have two planes at the North Pole. Our population has indeed increased!

May 26. Vodopyanov and Molokov are noticeably worried about the whereabouts of Alexeyev and Mazuruk. We are all convinced that they have made a landing somewhere not far from here.

After Molokov's arrival everyone settled down to sleep. We four—Ernst, Eugene, Peter[1] and I—unloaded the newly arrived equipment for our polar station. When the job was finished we lay down to rest.

At 6 p.m. good news came over from Rudolf Island: radio operator Stromilov had contacted Alexeyev's plane by radio. As we thought, Alexeyev had made a safe landing comparatively close to our drifting station. He says that he will shortly fly on to join us.

We have finished building the snow hut for the radio station. The roof we covered with a big parachute taken from the plane N170. The station consists of two departments—the radio department and an engine-room. We sank the motor 40 centimetres deep in the ice, lashed it down firmly and froze the ropes in. After that we started assembling the windmill. While we were on this job news came over from Ilya Pavlovich Mazuruk. He too had made a safe landing in the vicinity of the Pole. Splendid! Soon we shall all be mustered.

I have sent a radiogram home; I told them that I'm quite satisfied with my new residence at the Pole.

May 27. We resumed the task of assembling the windmill. We are all doing a lot of writing for the central and Leningrad newspapers.

[1] Krenkel, Fedorov, Shirshov.

Krenkel is squatting on his heels in the tent and swearing away quietly, but nevertheless is diligently transmitting all the correspondence. Sima Ivanov is giving him really devoted assistance. What an untiring worker to be sure! A real polar man! It is a pleasure to watch him set about his work.

So much has happened during the past twenty-four hours. Yet by the end of the day you get so tired, that when you open your diary you have to force yourself to remember and note it all down. With this I'll stop for to-day.

May 28. Alexeyev has arrived. His plane was speedily unloaded. The inhabitants at the Pole are increasing so rapidly that we are hard put it to supply everyone with "flats with all amenities."

We have started assembling the main living-tent. We chose a good position for it, for we do not propose to shift it until we end our work at the Pole. We have inflated the rubber cushions for the floor and covered them with fur skins to make it warmer for the feet.

May 29. All our concern now is to contact Mazuruk's plane by radio. Where can he be? On his plane is our principal hydrological equipment—the winch.

May 30. Vasily Sergeyevich went up in search of Mazuruk, but unfortunately did not discover anything.

Work is proceeding on the construction of the caboose—our kitchen.

The weather has again changed for the worse: a blizzard is raging, snow falling fast, and a strong wind of nine points is blowing. Communications with Rudolf Island are now and again interrupted.

May 31. We have contacted Mazuruk's plane by radio, and during the day we spoke with him several times. He has landed on an icefloe not far from here and is about to join us. The sooner the better! We are keen to get all our gear properly in order and start the full volume of our scientific work. When I think of the amount of work we have to do, especially Peter and Eugene, I get a bit scared. . . . A tremendous job has been given us by our country, and we must carry it out to the last letter. We are prepared to sacrifice everything for this.

JUNE

June 2. Ernst has notified the members of the Leningrad radio laboratory attached to the People's Commissariat for Home Affairs that the first communications between the Pole and land (Rudolf Island) were established with an apparatus produced by that laboratory. The instruments are functioning well. This will certainly please them.

Peter has set up his hydro-chemical laboratory, where he intends to begin his work here on water samples.

June 3. For the first time since we landed Ernst has received and written down in full the TASS news report. We learn that the French scientist Charles Papin has published a glowing article in *Humanité* entitled: "The Soviet Union and the Conquest of the North Pole."

He says: "The results achieved by the Soviet expedition at the North Pole are indisputable evidence in favour of a system which has dared to undertake such tasks and to carry them out."

Shirshov and Fedorov have seen a guillemot.[1] All the newspaper correspondents on the icefloe (and there are a great many of them here) hastened to inform their papers of this event: "Birds at the North Pole! . . ."

June 4. Short-wave wireless amateurs are bombarding Ernst with inquiries: each wants to be the first to establish wireless communications with him.

Eugene is carrying out gravitational observations. Peter has tested his home-made winch in a crack in the ice. He has made the winch out of a wooden drum fixed to a sledge. The hydro-biologist Bogorov has sent Peter a radiogram congratulating him and wishing him every success in his scientific work.

We're up to the neck in work!

June 5. At last Ilya Pavlovich Mazuruk has arrived. Now we are all assembled. The last lot of cargo for our station is being unloaded.

A friend of Ernst's—a wireless operator on one of the ships of a Caspian line—telegraphs that he would like to contact the North Pole by wireless. Poor Ernst! I don't suppose he'll manage them all!

June 6. Eugene has received a radiogram from his gallant little wife, telling him that in view of his small son's great resemblance to his father he has been named Eugene.

At 3 hours 40 minutes all our comrades took off for Rudolf Island. We were left by ourselves, the four of us, and we looked on, as all four planes in the space of ten minutes took off and flew away from us to the south. . . . *Bon voyage*, my good friends!

We lay down to sleep with thoughts of our good comrades now flying home, back to familiar and warmer climes.

One of the lads jokingly remarked that now our food reserves were safe; there had been danger so long as our comrades stayed at the Pole of their being consumed! But no one laughed at this joke. We felt rather sad at parting with our friends, of whom we had grown fond during the long months of preparations for the air expedition to the Pole.

In the evening Peter paid out the wire rope with the lead attached to sound the depth of the ocean. It turned out to be 4,290 metres deep. Peter took a sample of the bed, which was silt of a greenish-grey colour.

We ate our fill of a fish soup which I had made. The lads ate and pulled a face. I'm sorry to say the fish from which I had made the soup had a definitely strong smell, impossible to disguise even with pepper.

June 7. Our position is: 88°54′ N. Lat., 20° W. Long. We got up late to-day. At 12 noon Peter and I proceeded to establish a deep-water station at 3,500 metres. Eugene arranged his magnetic tent, and in the evening carried out his first magnetic observation. The scope of our scientific activities is continually increasing.

[1] A sea-bird common to the coasts of the Arctic Ocean.

Our pup Merry hardly justifies his name to-day. He is roaming dismally over the ice with hanging tail. Now and again he stops and looks around. Merry is off his food. He won't even look at sausage, though I put a slice right under his nose. We can sympathise; the pup is fretting: yesterday there were so many of us here, and now the icefloe is deserted. I felt sorry for the dog, I petted him a bit and whispered in his ear: "Merry lad, you're our pal. You'll be all right with us!"

June 9. We received a radiogram from Schmidt, on Rudolf Island, to say that all the planes have arrived and will soon be setting off for Moscow. *Bon voyage*, dear friends!

Krenkel repaired the accumulators.

We set out on skis to inspect our icefield. After that we gathered together for dinner. As we ate we recalled how we had said good-bye to our comrades when they were taking off for the south. We had a good word to say for Ilya Mazuruk; he left us a fine blow-lamp, which is a great help to us in our jobs. Eugene told us that when Mazuruk was taking-off Merry tried to jump into his plane and the pup had to be driven off by force. Poor Merry! It is plain he doesn't want to live at the Pole!

June 10. At last the long awaited fine, calm weather. Now we can start arranging our reserve dumps. We all rose early. Fedorov cooked the breakfast—an omelette with fat bacon and tea. We "fortified" ourselves well. At breakfast we talked of Moscow, of our relatives, friends and loved ones. How much they think of us and how interested they are in our welfare! We can sense this in every word of the shower of telegrams from home.

We have decided to divide our supplies into three dumps, the idea being that if the ice should split and one dump gets sunk or is crushed in the upheaval we need not worry as we shall still have the other two dumps to carry on with.

So as not to interrupt Peter and Eugene's scientific work I started on the "diggings" by myself. I scraped away the snow from the first consignment of cargo, dug out some boards, laid them on a sledge and hauled it to the tent. Then I took a second sledge and started hauling the provisions. I took four rubber containers at a time, each 44 kilograms.

As we intend to live on this drifting icefloe a good many months, it is essential for us to keep our gear and supplies in good order and to arrange our domestic life efficiently.

Ernst inspected and charged the accumulators, and as soon as he was free he joined me.

"Let me give you a hand," he said.

He and I started to shift the paraffin. Later Fedorov and Shirshov came up, and our work progressed still more rapidly. Two dumps had already been assembled, and we were busy getting the third together. Krenkel went off to cook dinner.

We have discovered that with the four of us pulling we can haul as much as 500 kilograms of cargo on the sledge at a time. Pulling a load like this makes your eyes pop out of your head.

We made a good job of dividing the clothing, food and paraffin. It's a great relief to know that we can still carry on if one dump goes to the bottom.

At five p.m. Krenkel shouted :

"Dinner's ready."

At the time we were hard at it arranging a fourth (main) dump near our living tent, in order to draw on it for "current expenses."

We sat down to dinner with a hearty appetite. We even allowed ourselves a small tot of brandy each. After the meal we lay down to rest for an hour, leaving Fedorov on guard. Eugene, of course, wasted no time, and while he was on duty he worked on the data of his observations. After we had had a short rest we went back on the job again.

We received important instructions from Moscow :

"Supply weather reports and wireless contacts for Chkalov's flight to America over North Pole."

Our airmen are doing something terrific. I wonder who Valery Pavlovich has in his crew. I bet he's got chaps with him just as tough, dependable and experienced at the job as he is himself ; probably the men of his old crew. Last year Chkalov with Baidukov and Belyakov following the Stalin route flew more than 9,000 kilometres non-stop, covering practically the whole of the Soviet Arctic. They flew over Franz Josef Land, Severnaya Zemlya and Yakutia. For this flight the Government awarded them the title of Heroes of the Soviet Union.

Congratulations, lads ! What is so splendid about them is that they have not rested on the laurels of their last year's flight, but are now to make another, of still greater daring. It is no joke flying non-stop from Moscow over the North Pole to America !

We're all certain that the boys will bring it off. This will be one more victory for our glorious Stalinist aviation.

Undoubtedly, the successful landing of a squadron of heavy planes at the North Pole and the organisation of our drifting station induced the Government to allow Chkalov to undertake this flight. Formerly there was nowhere a pilot could make a landing between Rudolf Island and the islands in the American Arctic. Now, 800 kilometres to the north of Rudolf Island, on the way to America, there is a Soviet settlement, small though it is. And if anything went wrong, our airmen could make a landing here. But never fear, that won't be necessary ; they'll make a perfect flight. Nevertheless, we shall do everything possible to ensure the best radio contact and supply them with weather reports ; and to be on the safe side we'll clear a landing place on our floating icefield.

It was very late before we went to bed, so busy were we talking of Chkalov's new flight. I'm sure it will arouse tremendous excitement all over the world ! Just think of it, the boys will have to fly non-stop nearly 10,000 kilometres.

Peter recalled an interesting fact in the history of aviation. Thirty years ago a prize was offered to the first airman who would fly non-stop one kilometre ! A year passed before the prize was claimed by a French airman who flew one kilometre in one minute thirty seconds. And now—

10,000 kilometres! . . . What gigantic strides the technique of aviation has made! In those days nobody would have believed that but three decades later men would cover such distances with ease.

We can be truly proud of our aviation. Our people call it "Stalinist aviation" because Comrade Stalin himself is so keenly interested in its development. It is Stalin we have to thank for such eagles as Vasily Sergeyevich Molokov, Chkalov, Gromov, Vodopyanov and others.

It was turned midnight when, after having tea in the kitchen, Peter and I crawled into our sleeping-bags. Ernst and Eugene remained on watch: it is now time for them to make their routine meteorological observations and transmit the weather report to Rudolf Island.

June 11. At last the blizzard has died down. It wasn't quite so bad yesterday, but it raged as hard as it could on June 8 and 9. Now we'll have to get busy clearing away huge snowdrifts. Eugene says that the day before yesterday the gale velocity at times attained twenty metres per second. We understand that this is only the bloom—the fruit has yet to come! We'll meet with far worse blizzards than this one out here!

At midnight the wind dropped. The weather was clear, with not a cloud in the sky. The sun's rays warmed our black tarpaulin tent up to 24° above zero.[1] Capricious weather indeed! What you have to expect at the North Pole!

A south-west wind is driving our floe to the north-east. We are approaching the Greenwich meridian. Quite likely we may soon find ourselves in the eastern hemisphere. Peter announced:

"The average speed of our drift during the first seventeen days has been six and seven-tenths of a kilometre per day."

Later on presumably the speed of our drift will increase, but as yet no-one can foretell this with any degree of accuracy.

We rose early to-day, though we slept badly. All night long we kept on discussing how we can best serve Chkalov's flight. I'm afraid Ernst worries over this more than any of us. Our accumulators are run down and there's not a breath of wind, so the windmill doesn't function. We are keeping the motor as an emergency unit, to be used only in the most unforeseen circumstances. Well, there's plenty for us to worry about now that we have been made responsible for servicing this unprecedented flight to America via the North Pole.

I cooked breakfast consisting of three sausages each; put out the caviare and made the tea. One thing we can't complain of is the food: our diet is satisfying and varied. As for the tastiness of our dishes, that depends entirely on the "chefs"—Ernst and myself. I must admit that we are still inexperienced in the culinary art.

After breakfast I stowed away the supplies left over from the dumps, and filled with paraffin the container in daily use. Then I proceeded to place fish and meat into the "refrigerator" we had cut out in the ice. Although at present the weather is not too cold for the Pole, the sun is shining day and night. I am anxious lest the sun's rays should penetrate

[1] All temperatures are in centigrade.

through the ice and spoil our very limited supplies of fresh meat and fish.

Ernst and I listened in, via Dickson, to the latest news bulletin over the radio.

We sent a telegram to Moscow: "In the event of Chkalov flying over the North Pole Station, please arrange for the dispatch to us of newspapers and letters from our families."

We hope that Valery Pavlovich will be able to drop this small but priceless package from home on to our icefloe.

I've been hauling supplies. Krenkel cooked the dinner. In the morning Shirshov went off to his laboratory to make hydro-chemical analyses. At midday Eugene handed Ernst the results of the latest meteorological observations.

I had a brain-wave and cut up one of the empty food tins which made a big washing-up bowl for the dishes. I also made a special funnel-shaped utensil for pouring the paraffin into the primuses.

Krenkel has again tested his radio apparatus and Eugene has been working on the data of his gravitational observations. Peter, too, has been busy on his pet idea of obtaining chemically pure water.

This evening he came into the tent and announced:

"I've had another look at the fissure; you would hardly recognise it. The ice is rapidly moving apart; either our own icefield has moved or the neighbouring fields have drifted away."

"We now seem to be living on an ice island," said Krenkel. "The wind has broken up the ice."

"I, too, heard the ice rumbling," observed Eugene. "It was about 2 a.m. when I was making some meteorological observations."

"Even so," I replied, "it shouldn't interfere with our living and working here . . . Our floe is tough. You see, we'll be able to live on it for quite a while!"

"Yes," chimed in Shirshov, backing me up. "Who would have guessed that the icefloes in the Central Polar Basin would turn out to be so strong and level."

Krenkel began tapping out his dots and dashes with his radio key. Then he proceeded to take down incoming messages. One of them was from Lasker, challenging me to a game of chess. I'll have to start getting into practice.

"Wait till I get back to Moscow, then we'll have the game," was my reply. "Or would you like the four of us to play you?"

If it were not for the clocks we should never know night from day, as the sun shines warmly throughout the twenty-four hours.

The Academy of Sciences of the U.S.S.R. have asked us to carry out certain scientific work, i.e., to ascertain the causes for the non-penetration of short radio waves at certain periods in Arctic conditions. This is a fascinating problem.

June 12. This morning Eugene was the first to get up, the buzz of the alarm clock woke him. After Eugene, Ernst woke up. He did not, as he usually does, stretch and yawn in his bunk, taking his time over

getting up, but jumped up straight away. Shirshov and I, also, decided not to lie in. We got up, and while we breakfasted listened in to "Latest Radio News." Whenever we listen to the news from home, I feel grateful to that remarkable Russian engineer Popov, the inventor of the first radio-telegraph in the world. It was he who gave humanity this wonderful means of communication.

I cannot imagine, for instance, how the air expedition to the North Pole, and our work on the drifting floe, could have been carried through without the radio. Though so far away we are connected, as it were, by invisible threads with our beloved homeland. The radio enables us to make an inquiry of Moscow and to receive a reply within two or three hours, and to listen in to the voices of our families and friends.

Shirshov has hurried off to his laboratory, to make sure that his precious phials of water samples haven't frozen. I have been examining our gear, as we have had no time since the departure of the planes to check up on all the sacks and knapsacks.

On the whole our life on the floe is pretty lively, and even more varied than I had expected. We talk a lot about our helpmates.

Krenkel occasionally says to me: "I wonder how they are?"

"At this very moment," said Shirshov, all his thoughts in Moscow "they're probably at a concert, or at the theatre."

"We ought to send them more regular news from the floe," I remarked, "for any long silence will only make them worry about us unnecessarily."

Eugene agreed.

"Of course," he said, "we could cut down a bit on our newspaper articles, but we ought not to cut down on the short radiograms to our families."

I recalled the winter I had spent on Franz Josef Land, when I had my wife with me.

"How about organising a drifting station on an icefloe, and taking our wives with us," I said, jokingly; "and settle on the ice with our families, turn it into a real Soviet town."

Krenkel, however, wasn't very enthusiastic and immediately put forward his strongest objection.

"What an idea, Dmitrich! That would mean building ice-crèches, snow maternity homes, toy factories. And we'd have to bring nurses and teachers with us, I'm afraid the bears aren't trained for that sort of job. . . ."

Meanwhile, our windmill has started turning still more vigorously.

The wind has increased. Ernst went out repeatedly to see how the windmill was working. During the past few days we have all been anxious for the wind to rise. Our accumulators have been so low that we have been afraid to send out a superfluous word over the radio. We even stopped sending news to our families. All we have transmitted have been the weather reports.

The velocity of the wind has increased to 4–5 metres per second and the windmill has started turning. Naturally we are delighted—there is no need to start up our petrol engine. Each one of us straight

away wrote out and dispatched a radiogram to his family. The accumulators are still charging up splendidly.

I went to inspect Petrovich's "kingdom": the hydro-chemical and hydro-biological laboratories. They have been fixed up remarkably well. A snow hut stands over the opening cut in the ice, and in here Peter has conveniently arranged his winch and hydrological instruments. Naturally, Muscovites haven't the least idea what a wonderful building material snow can be in June! Unfortunately, in Krenkel's snow hut the water from the fissure has overflowed the ice floor. Poor old Ernst! he will have to move to a new home.

Ernst has cooked the dinner; there wasn't much preparation to do, as for the third day running we are eating the same borshch and cranberry jelly. Ernst diluted our "pudding" with water, which failed to reduce its acidity. By to-morrow I should think that our excessively diluted cranberry jelly will have turned into cranberry juice. . . .

After dinner Eugene worked on the data of the gravitational observations. Shirshov was busy doing titrations; Ernst washed up the dishes.

June 13. At 6 a.m. as usual, Krenkel and Fedorov transmitted the weather report to Rudolf Island and then went to rest for an hour or two: they had slept very little and badly during the night.

Peter and I hauled snow-bricks for the new "building" to be erected for the hydrological winch.

Then I checked up on the state of our machinery department: we are worried about the safety of our motor as a crack in the ice runs right under it, and the place is rapidly filling up with water. Peter Petrovich and I hauled the motor out and put it on a sledge. It should be safer there.

Federov has been playing around with his scientific instruments. He has dismantled the tent in which he carries out observations and spread it out to dry. He intends to shift the tent to another spot, nearer to our living-tent, so that, at the first signs of the ice breaking up, he can save his precious instruments quickly. I approved of the idea.

We have now been eating our ill-starred cranberry jelly-juice for four days. It is just possible to swallow the stuff, after a fashion, with some of the soda flapjacks that Ernst made to help it down, but by itself we can't tackle it. . . .

Ernst to-day is as happy as if it were his birthday. A boil on his back, which has been giving him great pain at the slightest movement, so much so that each time we looked at him gave us a pang, has burst at last. We congratulated him heartily on getting rid of his misfortune.

I received a telegram from my darling Volodichka[1]. If she only knew how happy it has made me! I sent an answer: "I'm feeling fine. I think of you every minute of the day my beloved!"

June 14. A literary agency has wired from Moscow that tremendous interest is being shown in our scientific work by the foreign press and

[1] The nickname I gave to my wife, Galina Kirillovna, during the expedition to the Aldan in 1925, when she so courageously shared with me all the hardships of the marches.

asks us to supply information for the foreign papers regularly, twice a month, on our life and work on the icefloe.

Ernst and I went off on skis to examine our icefield. There is now a big stream where the fissure used to be. We'll have to be on the alert and keep a sharp look-out, to see that this fissure doesn't let us down. Shirshov worked at the hole with the winch and I helped him. At midnight he will start fixing up the 24-hour station. This will mean a 24-hour stretch at the winch for him without a break.

Federov has examined another part of our icefield and says that there too he saw great cracks and fissures.

Apparently we are living on a floating island of ice!

Sasha Pogosov, a polar worker, has sent us a comic radiogram: "Low cloud in Moscow, temperature 10 degrees below zero; visibility 2 metres; atmospheric precipitations. Urgent intervention of your 'factory' required. Please book an order for fine weather."

Who knows, someday, an Arctic "weather factory" may take this sort of order as a matter of course. For the present, worse luck! we still have to battle with the elements. . . .

The blizzard has given way to clear weather, and the temperature is 7 degrees below zero. Another guest from the south flew over our floe—a fulmar. A south-west wind has started blowing; this means we shall probably be carried slightly northwards in our drift. All the better! We will be able to carry out our supplementary scientific work in high latitudes.

June 15. Soviet short-wave radio amateurs have organised an All-Union competition for contacting our radio station. Poor old Krenkel will now be up to his ears in work!

I intended to spend the whole day working the winch, but by midday I couldn't stick it out any longer and lay down to rest for two hours. Ernst and Eugene helped Shirshov. This fine young Soviet scientist is an example to us all by his utterly unselfish devotion to his job. Eugene is a good runner-up.

I have noticed that on the whole the work doesn't go so well at night, and we all feel very drowsy. This is probably the time when our land habits begin to tell on us—we are so used to sleeping during the night hours.

Peter has asked for some fresh fish, so I thought I would give him a treat. I got out a fresh Siberian salmon and choosing the best cuts, I salted them, rolled them in flour and then fried them. Peter was delighted. He is an excellent worker and deserves to be well looked after.

The labours of Peter and myself will soon be over now. The bathometer has only to be raised once more, and then we've completed our 24-hour station. We are now waiting for Ernst to tell what news he has heard over the radio, and whether there are messages for any of us.

We are very keen to know when our planes are finally going to take off from Rudolf for the mainland. The sooner they reach our beloved Moscow the better we shall be pleased. We should like everyone to see

these Soviet planes which landed on the North Pole, spent two weeks there and then returned safely to Moscow. Their flight to the North Pole and their successful landing on the ice constitute a triumph for Soviet aviation.

June 16. Some of the radiograms that Ernst takes down are most amusing. To-day, for instance, he read us the following command received from Staraya Russa: "Close down the North Pole; it is cold on the mainland."

Shirshov has gone off to chip ice for making distilled water. Fedorov is still setting up his gravitational instruments. He found he was short of stands, so we had to take the butter out of the cases, wrap it in paper, and use the cases for stands. Then I set to work making a new suspended table for Shirshov's hydrological samples.

We had to spend two days' work on the hydrological station, feeling for the upper limit of the layer of warm Atlantic water. These observations are of great scientific value; Peter will shortly be examining the results. In the meantime, while Peter and Eugene were defining the drift to ascertain the exact direction it was carrying us, I proceeded to put my "office" in order. I have to keep a diary giving an account of our life and work, write all sorts of memoranada relating to the organisation of our station, compose newspaper articles and reply to radiograms of congratulations.

Our floe is surrounded by a channel 10 to 20 metres wide. Constant watch has to be kept on old and new fissures.

We have set up a little table in our living-tent on which stand the water samples, to keep them from freezing before they can be analysed.

Eugene has established a third magnetic point and carried out a series of observations on gravity.

I have had to give our dog Merry a thorough hiding. He deserved it, as he keeps on barking for no reason. When Fedorov carried one of the instruments out of the tent, Merry began yapping like a mad dog. I think the lesson I gave him will have its effect on the dog and he'll stop his senseless howling in the polar night.

June 17. Our snow kitchen has succumbed to the heat of the primuses and melted away. Well, we'll build a new kitchen, this time using sail cloth.

Sleet is falling. We had to go out to the dumps and cover up everything, so that our spare clothes, furs and other articles won't be ruined.

Ernst and I listened-in to Dickson, and reception was quite good. We enjoyed hearing the review on foreign affairs very much, as we are all particularly interested in the Spanish people's struggle against the Fascists.

Huge snow-drifts have piled up around our living-tent, and I have to shovel them away. My jersey got soaked through in the process and I had to go back to the tent to dry myself. Let's hope this blizzard will soon die down.

I've been spending my spare time making a small bedside table to hold various small items.

Fedorov has fixed a wire to his tent to receive the signals of the chronometers, which are kept at the radio station. Shirshov has taken all fifty jars containing water samples and gone off to work in his laboratory.

I was just about to go to bed—it was 12.30 a.m.—when Krenkel came rushing in with the news :

"Chkalov is taking-off from Moscow in two hours' time to fly to America !"

How our hearts rejoice for him and his crew. We wish the best of luck and success for the lads, on this all important, historic task.

For a long time after Ernst's announcement, I couldn't sleep.

We shall have a busy day to-morrow !

June 18. Rudolf Island informed us that Valéry Chkalov took off this morning at 4 a.m. I persuaded Ernst to turn in and get some sleep as he would be working all night. After a short nap Ernst sat down at the radio.

"I can hear the radio on Chkalov's plane quite distinctly," he announced. "He will soon be nearing Rudolf Island."

The other two lads are busy with their jobs : Peter is doing titrations, and Fedorov is making a 24-hours series of gravitational observations.

As for me, I can think of nothing but this unprecedented flight ; my thoughts, like the thoughts of all my countrymen, are at this moment with our heroic airmen, who for the first time in history are blazing the air trail from Moscow to America via the North Pole.

However, we also have our ordinary everyday cares. Merry is in trouble again. I had jointed a roast pig and laid it out in the open, to air ; Merry flung himself on the pork and gorged himself until his legs could hardly support him. We have decided to "penalise" him : to starve him for three days.

Ernst has just taken a radiogram from Chkalov :

"We are flying blind."

A few seconds later :

"Slight ice formation."

With bated breath we awaited fresh reports. . . .

"Slight knocking in the engine," came over from Chkalov's radio.

One hour later :

"Can see the Rudolf beacon. Everything in order."

A weight fell from my heart. Happy landings, chums !

I have made a radio desk. Directly Chkalov's flight is over we'll shift the radio receiving set from the snow hut to the living-tent, which will put our minds at rest with regard to the instruments. To us our radio receiver is our very life, and we cherish it like a doting mother her child—we fuss over our instruments, our windmill which charges up our accumulators. We should be in a tight corner without this windmill, as the petrol for the motor would not last long.

At 10 p.m. Ernst reported :

"The flight is going well, everything is in order."

Every three hours Eugene sends over supplementary weather reports direct to Chkalov's plane and to Moscow.

Needless to say no one dreams of going to bed to-night. We are all too keen on following Chkalov's flight: he might even make a detour and fly over our camp. But it's very unlikely that Valery Pavlovich would want to do such a thing. Every single kilometre along the direct route is precious to him.

June 19. An unusually tense day. Ernst spent the whole night without a break at the radio following Chkalov's flight. At 5 a.m. Ernst came into the living tent and announced:

"Chkalov is now half-way between Rudolf Island and the Pole."

From the plane's radio came the report:

"Flying along Meridian 58 to the Pole. Cyclone on the right. Level cloud bank on the left."

And a few minutes later we heard a distant drone . . . Could it be Chkalov's plane?

Eugene dashed outside—but could see no sign of a plane in the sky. Straightway however he came running back, and shouted to me through the tent flap:

"It's Chkalov, all right. I can't see the plane yet. The clouds are too thick, but I can hear the engine distinctly."

This was at 5.50 a.m.

We all rushed out of the tent, cursing the clouds a thousand times. When nothing's happening, the sky is clear, and now, at this critical moment, it's all clouded over. We had so hoped that Chkalov would be able to spot our camp and drop us at least one little newspaper, and perhaps a few letters from home. How we longed for those letters.

But the drone of the engines grew fainter and fainter. The plane had flown off to the north. We were so tense with excitement, that it is beyond my powers to express our feelings. For the tenth time we cursed the weather. We were simply furious that man was still unable to regulate the elements. The drone of the engines finally faded out altogether. Ernst turned round and said to me:

"I say, Dmitrich, how about putting the emergency motor into operation; there's a dead calm and the accumulators are right down. I should hate to let down Chkalov and his boys: we're the very last Soviet communication point capable of hearing them."

So I fetched a plane step-ladder, fixed the motor on it, lashing it down with a silk rope, and ran it for half an hour. Later on, we switched the motor on again and Ernst listened-in to Chkalov's plane.

The weather to-day is abominable, and our mood is in complete harmony with it. Outdoors one's clothes get soaked, in the kitchen the snow is melting and the walls are collapsing: the radio hut is dripping badly.

Later Ernst brought in a radiogram from Chkalov:

"Have crossed the Pole. A following wind. Can see icefields with fissures and clearings in the ice. Spirits high."

How I longed to send those three lads an encouraging radiogram, but it would only waste the boys' precious time. Patience, in 24 hours they'll already be flying over America!

Peter is preparing his hydrological equipment. To-morrow morning he is to set up a deep-water station.

I dug away the snow near the tent, reached down to the ice and discovered a big fissure. When I struck it with my ice-pick, sea water welled up. It seems that the floe on which we are living has many fissures running in all directions. This means we must be even more vigilant although during the last two days none of us has had much sleep; the work has had to be divided in such a way that one of us keeps a look-out over the field. These fissures are a real menace to our safety.

We have received the following instructions from Moscow: "Stop sending supplementary weather reports."

Ernst is sleeping at last; he has been awake for thirty-six consecutive hours.

June 20. This morning Peter and I got up rather earlier than usual, but Ernst was already up and greeted us with the good news:

"Chkalov is now flying over Canada."

We got the winch ready. A routine heavy job awaits us to-day—sounding the depths of the ocean.

At exactly 12.30 a.m. the lead touched bottom. The depth was 4,374 metres—84 metres deeper than at our first sounding. This means that in the centre of the Polar Basin, as Peter surmised, the ocean is very deep and that there can be no possibility of land in the vicinity as some scientists had supposed.

When taking the depth sounding we had to pay out 4 kilometres of cable on the winch.

Our position to-day is: 88°47′ N. Lat., 10° W. Long.

It took us five hours hauling up the lead. When we drew out the last bathometer we found it had been badly damaged and the thermometers on it had cracked: they had been unable to withstand the pressure.

Peter then established a station at a depth of 1,000 metres.

The weather is overcast, with no wind. There is a slight thaw. Visibility is two hundred metres; wet snow falls frequently.

Eugene completed his gravitational observations yesterday. He made magnetic determinations at three points. The wind and the current are carrying us along with colossal masses of ice, which gives us the opportunity of studying new places. What a stroke of luck!

Over supper, this evening, we realised that to-morrow will complete a month since we landed on the floe. We sent a radiogram to the party of polar workers on Rudolf Island, thanking them for their assistance in our work.

This first month has gone by quite quickly in organising the efficient running of the station, in scientific work, and the establishing of supply dumps.

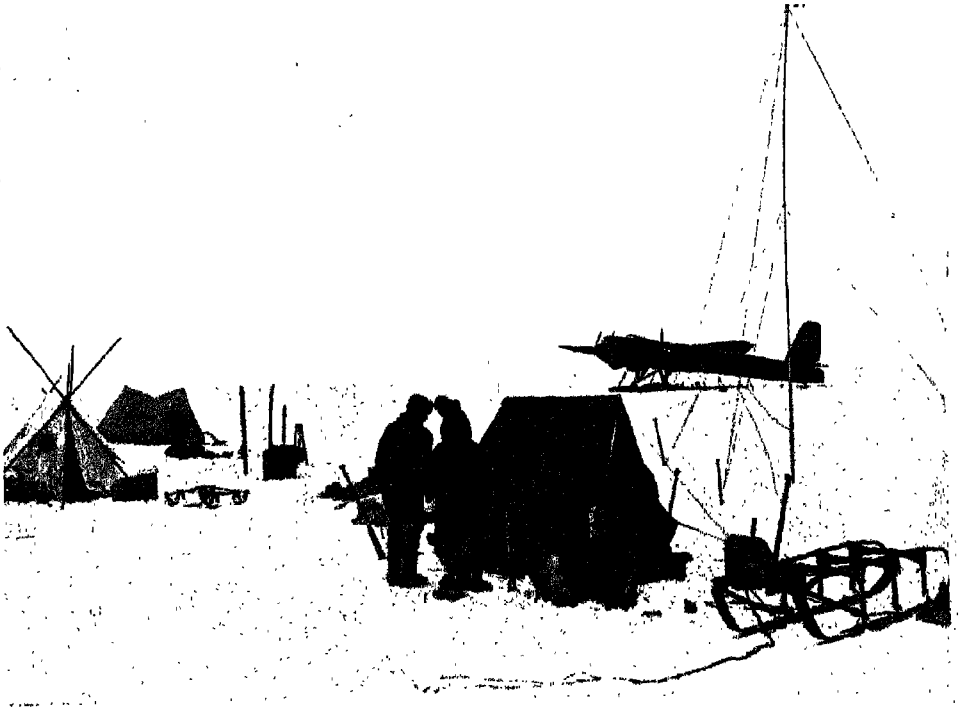
"Actually, we've spent most of this time getting used to living on the floe," remarked Peter.

"We've already made quite a few discoveries this month," chimed in Krenkel, who was busy tuning-in the radio.

"Still we've achieved very little, so far," said Eugene. "Although

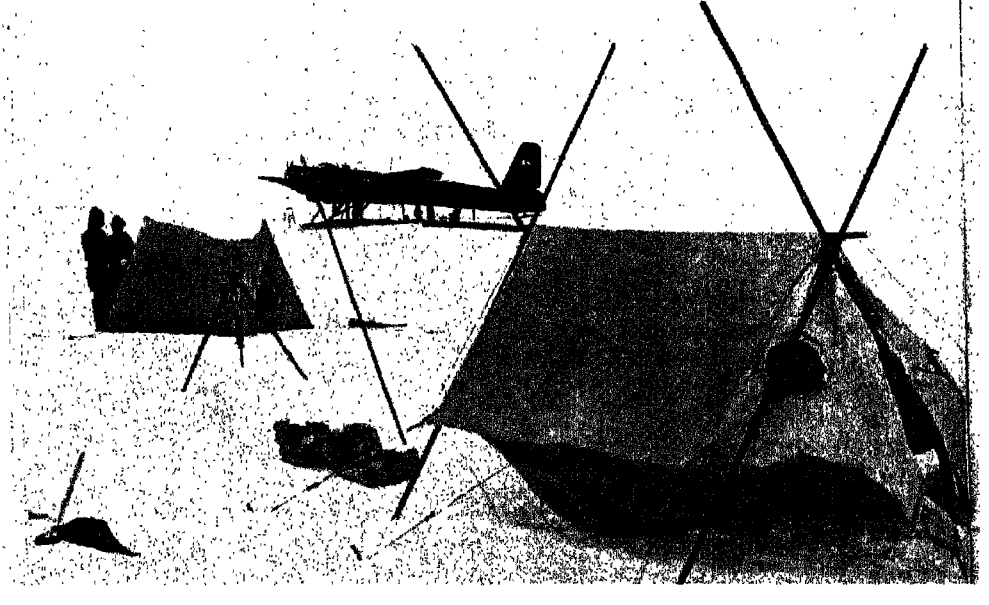
Papanin at the North Pole

Ernst Krenkel—radio operator on the drifting icefloe



The Papaninites arranging their camp. Vodopyanov's plane in the background

Building the camp on the icefloe. The first temporary tents



our plan has been realised, if one can talk of definite plans on a drifting icefloe, to carry out any serious scientific research one would have to stay here a long time."

"Yes," I interposed, "Eugene is right. We'll have to spend nine or ten months in this hut, or perhaps even a year. How's that brothers?"

"What of it?" answered Shirshov. "A year isn't so terribly long, and time always flies when one's busy. I haven't even noticed how this month has slipped by."

"It's the same with me," I remarked. "In future we'll have to keep ourselves so busy cramming every minute with work and scientific research, that we won't have the time to feel homesick."

We decided to send radiograms home and for the next ten minutes the only sound in the tent was our laboured breathing as we wrote them out.

We were just turning in, when Ernst rushed into the tent shouting: "Hurrah! Chkalov has landed in North America, at a military aerodrome in Vancouver."

The four of us let out a mighty chorus of "Hurrahs!" for our heroic airmen, and for the latest triumph of Stalinist aviation.

June 21. So to-day marks exactly one month of our life on the icefloe. I must admit, that so far we've had no cause to complain of the floe. It has "carried" the station well!

The vast amount of equipment brought here by the aircraft has now become familiar to us. All the supplies have been put in order. Each object has its own special place. We have elaborated a daily routine. Shirshov and Fedorov usually spend sixteen hours a day in scientific research and take part in the general work of the camp only when it is absolutely necessary. Krenkel is occupied with the radio and in the kitchen. I too, take a hand at the cooking. He and I are thus the superintendents of our "spiritual and material goods." I am responsible for all outside work, the regular inspection of the dumps and the keeping of a close watch on the condition of the ice on our floe.

Our icefield is so strong that spontaneous compression or packing is hardly possible. The only danger is from cracks which might cause it to split asunder. That is why we always keep several empty sledges ready to move the dumps in case of danger. So far everything has gone along splendidly.

We had all got together to celebrate in style the completion of the first month since we landed on the ice, but now, apparently we won't be able to celebrate after all. We can't prevent these troubles; the kitchen has to be fitted up and the radio moved without delay as Krenkel can't work: the water keeps dripping on to his head, he's simply flooded out. We've decided to use our white tent as a temporary kitchen. Anyhow, we shall have to put an eiderdown cover on the living-tent in the latter half of August, and then we'll be able to build a permanent kitchen of ice, to last us a long time.

We had dinner in the new kitchen, and to-day's menu was good: pea soup, fried fish, stewed fruit, and to cap it, a small nip of brandy in honour of the jubilee.

Over dinner we arranged to send articles to *Pravda*, *Izvestia*, and TASS, on the results of our scientific observations during the first month. Peter and Eugene were busy till evening working on the data. It was after midnight when Ernst and I sent a long article to *Pravda*, entitled "A Month on the Icefloe."

June 22. We have put the living-tent in order. We carried everything outside—the furs and inflated rubber mattresses; we took up the plywood floor; round the tent we made a snow embankment, which we lined; the inflated rubber floor we rolled inside, turning up the edges to keep the moisture from the furs. Then we put down the plywood floor with the fur rugs on top and put the bunks in place. When we had finished this thorough turn-out, we separated and each went about his own business.

Ernst and I set about shifting the radio station. We moved the aerial mast, put up the aerial, and fastened down the desk. Ernst arranged his apparatus: transmitter, receiver, accumulators; fixed an aerial lead-in and within thirty minutes was testing the radio. There was a slight crackle interfering with reception, which Ernst very quickly eliminated, and by 8 p.m. he was transmitting the routine weather report to Rudolf Island. In fact everything is ship-shape!

In the meantime Eugene had shifted the case containing his instruments to his new premises and laid a cable from the chronometers to his observatory for measuring the force of gravity. Peter did his titration.

At 2 a.m. Ernst received a radiogram from Moscow from the Central Administration of the Northern Sea Route, which said:

"Within the next few days a non-stop flight will be made over your drifting station by the aircraft No. 25, piloted by Hero of the Soviet Union, Gromov. To record the flight of this plane, the Sports Commissar of the Central Aviation Club has appointed E. K. Fedorov, who will have to give the position and time the plane flies over your station in a form to be communicated to you later."

How do you like that! The Chkalov crew have barely completed their fabulous flight, and now some more of our Soviet eagles intend to beat it. Eugene says it looks as if Gromov intends to set up a world record for long-distance flying along both a straight line and an indirect course.

Now then, Ernst, get ready for work!

June 23. This morning Fedorov and Krenkel were a quarter of an hour late in getting up; they were let down by their alarm clock, which for some reason never went off at the time for which it was set. It transpired that during the night, when we were all asleep Eugene was wakened three times by the alarm going off. At last he got into such a rage that he stuffed the clock into a sack! Obviously the alarm had been rather too well muffled.

We are glad now that we shifted the radio station. The snow hut which had served for a long time as the former premises of the radio station collapsed last night. If we hadn't moved out all the apparatus in time it would have been buried under the snow.

I sent a radiogram to Volodichka asking her, jointly with the wives of Krenkel, Shirshov and Fedorov, to send letters and papers by Gromov's plane. He may be able to drop us a packet on his flight over the station.

After dinner we all assembled to listen-in to a concert and news from the homeland. Much interest is being shown in Moscow, also in foreign countries, especially America, in Valery Chkalov's flight. Telegrams of congratulation are being sent to him from all over the world. I cannot tell you how delighted and proud we are of the remarkable triumph of our Stalinist eagles.

June 24. At the request of the headquarters of Gromov's flight we transmitted to Moscow detailed data of the magnetic declinations of our region. It is owing to Fedorov's scientific labours that we're able to do this. We're delighted that our work is of practical value so soon.

The blizzard snowed up all the dumps and tents, and I had to go out and lash down all the stuff more firmly and check up to see if there were any fissures beneath them. I came home covered with snow.

Eugene has begun teaching Ernst and myself meteorology. We have studied it before, so we know a bit about it. Eugene is now showing us how to use the new instruments. I'm sure that by the end of the month I'll be able to carry out meteorological observations on my own; the technique of these observations is simple, the main thing is to learn how to codify the data correctly into a report, so as not to get them mixed up.

This evening Peter has gone off to the laboratory to work until five o'clock in the morning. Ernst switched on the radio and treated us to a concert; very enjoyable.

Krenkel is writing a new article for *Pravda*. As Peter went off to his laboratory he told us that to-morrow he intends to transmit an article for *Leningradskaya Pravda*.

Eugene, as usual, is working on the data of his astronomical and gravitational observations.

At last our two-day state of emergency, for the purpose of setting the camp in order, has come to an end. I had to spend the whole day making ice supports for the wireless masts, to take the place of wooden stakes. Reception has considerably improved since we shifted them to their new position. Admittedly, Peter has had to sacrifice 300 metres of cable from his reserve supplies to achieve this. Our windmill, I'm glad to say, is well dug in; its foundation consists of two food containers, sunk into the ice. Now, this plucky little machine, which supplies us so dutifully with free power, will stand up to any gale.

June 25. After breakfast Ernst turned in as he has been on duty all night. We have now arranged that Ernst takes over the nightly watch. It is his job to go out every hour to see whether any fissures have appeared in the ice, so that we should know of any impending danger in good time and be able to save our equipment.

I am now training for meteorological work and every time the routine weather observation has to be taken I go off with Eugene.

A strong wind has been blowing for the last two days which has carried us four miles eastwards.

After dinner Ernst and I put up a new mast for a special aerial, to enable him to contact radio amateurs. I've no doubt, this will be the answer to the dreams that many short-wave amateurs have of contacting our radio station "Upol."

We listened with delight, via the radio station on Dickson Island to the description of the reception given to-day to the members of the Polar Air Expedition on their return to Moscow. Comrade Stalin, with leaders of the Party and the Government, were at the Central aerodrome to greet them. Dickson Island read out our letter written to the airmen and all those who took part in the expedition.

I'm waiting impatiently for a telegram from my darling Volodichka, as to-day she ought to get my letter, which was sent by plane from the Pole.

Ernst keeps on tap-tapping with his key, calling radio amateurs, but poor reception prevents him from making any contact.

It's a good thing that the raging blizzard has died down at last. Our tents are snowed up. During the night we slept badly, listening to the gusts of wind, and going out frequently to inspect the dumps.

The outside temperature is 2 degrees below zero, while in the living tent it is from 4–8 degrees above zero.

We sent a telegram to Moscow to-day, welcoming the floating of the Government Defence Loan. Altogether we four subscribed 10,000 roubles to the loan.

June 26. Reception from the Moscow radio stations has improved a lot. Every morning we listen-in to the Moscow Press review broadcasts.

Greatly to everyone's satisfaction, the sun has put in an appearance to-day. I left the tent and began emptying the petrol from the rubber containers into a metal tank. Altogether I emptied eighteen containers. I had spent a long time trying to repair the pump, but I had to give it up; I syphoned the petrol in the good old way—by mouth through a tube. While I was doing this, by accident I swallowed some of it. When I returned to the tent Ernst said facetiously: "Look out chaps, don't smoke anywhere near him, or show a naked light—he's combustible, and might blow up!"

Eugene made an astronomical observation: it appears we have been carried four miles back to the north.

Good news! Ernst has made his first contact with a radio amateur—a Norwegian short-wave amateur from Aalesund.

Sometimes we're able to listen-in to concerts from Paris, Stockholm and London. Ernst is still busy at the radio. We're all waiting to hear what news he picks up. . . .

Hurrah! Ernst has just had a telegram from Moscow: the members of the Polar Air Expedition have been received in the Kremlin; Clement Efremovich Voroshilov toasted us in Comrade Stalin's presence and the whole country is interested in our work.

We feel deeply moved by the esteem shown by the country to the work of Soviet airmen and Arctic explorers. How we should have liked to get a peep of the Moscow reception!

June 27. To-day I've been collecting various articles of daily use: silk ropes, fur skins, covers, etc., and piled them all up in our storehouse tent. Then I loaded some tools on a sledge which I hauled over to a heap of ice-blocks, and proceeded to dig a pit for our fresh provisions which have to be shifted from the melting refrigerator. I worked without a break until Ernst called me in for dinner.

Ernst is extending his international relations! Since his first conversation with the Norwegian, he has already contacted a French radio amateur, in Rheims. Last night brought Ernst a further achievement—he made his first contact with America and spoke with a short-wave amateur from New York. Both the Frenchman and the American were delighted to have contacted the North Pole radio station. They knew about the job we were doing out here and wished us every success.

Ernst spends long hours at the radio station—listening to broadcasts from the European capitals, to stations in Argentine, Brazil, the Hawaiian Islands, the U.S.A. Ernst has announced that he will give a prize to the first Soviet radio amateur who contacts him; the prize being his own radio receiver, which has been deposited in the offices of the magazine *Radio Front.*

Peter has lowered his plankton net to a depth of 1,000 metres, to ascertain whether any animal life exists in these latitudes. Eugene again carried out observations of magnetic variations.

"It's been an interesting day to-day," he observed; "there have been violent magnetic storms."

Towards evening I helped Peter raise the net. He's triumphant—it contained innumerable small fauna of various kinds. This is indeed a discovery! With great care he transferred the fauna into jars.

Our scientific work is going well. The data of two deep-water stations and of one 24-hour station have already been worked up completely. Also we are keeping a regular log of the weather.

To-day I stupidly cut my finger. Ernst has painted it with iodine and bound it up. I found it too painful to do any manual work, so I went into the tent to write up my diary.

The sun is shining weakly through the dense fog and drizzle. How quickly the weather changes out here. Only a short time ago there was a beautiful rainbow in the sky which lasted several hours.

I'm afraid we're all very fed up with Merry; he continues to bark and prevents us from sleeping. For the last five days we've had to keep him chained up, as a punishment for stealing meat. When we set him loose to-day the dog was so delighted that he jumped up and licked every one of us. Although I often beat Merry he is very devoted to me, the reason being that I am the one who feeds him, and dogs in the North are always devoted to the master who feeds them. Merry is also very fond of Ernst and even puts his paws around his neck. But for some unknown reason he always barks at Peter.

June 28. All of us except Ernst were in our sleeping-bags. Suddenly he called out to us that after he had transmitted the weather report he had got Moscow, they were reading out a list of persons who had

been awarded Soviet honours. Ernst only caught Fedorov's name, but what honour he has been awarded, he couldn't make out.

I got up, gulped down some tea and went off to cut out a new "refrigerator." The weather is terrible; real rain is falling, and streams of water run all over the place; also the kitchen is dripping. The force of the wind is 18 metres per second. With a wind of great strength, our windmill won't work; its sails fold up.

In a very short time my clothes got soaked through. It was impossible to work outside so I went back to the tent to prepare the dinner and get myself dry in the meantime. While the shchi[1] was cooking in the saucepan, Ernst was busy contacting Rudolf Island, transmitting the meteorological observations which I had carried out to-day on my own. The transmission from Rudolf Island informed us that the Government had conferred on me the title of Hero of the Soviet Union. When Ernst told me this, I was so moved that the tears rolled down my cheeks. Ernst, Peter and Eugene were awarded the Order of Lenin.

It was 6 p.m. when Rudolf Island informed us they had hundreds of radiograms of congratulations for us. Ernst tapped out the weather report and then began taking them down.

I opened up a keg of brandy and we drank the health of our beloved Joseph Stalin, hugged each other, congratulated one another and made a solemn vow: to work with renewed effort up to the very last minute of the drift, achieving as much as possible, in order to justify the confidence our country had placed in us. We sent a radiogram to Moscow, asking that a message be sent to Joseph Vissarionovich, saying that we four would work together in complete accord for the enrichment of Soviet science, and for the welfare of our beloved Motherland.

Eugene is making gravitational observations. Ernst is having a busy time of it, taking down dozens of messages of congratulations.

June 29. When I finished making the new "refrigerator," a more reliable one this time, I dug up a frozen pig, hauled it over to the new place, where I jointed it, and laid out the pieces. Then I went back and dug out a nelma[2], a fine fish which weighed over 40 kilograms. After cleaning and gutting it, I salted it and laid it carefully in the "refrigerator," bricking up the outside with snow-bricks and turning the place into a kind of vault.

The wind has considerably increased the speed of our drift; the floe is moving rapidly in the direction of North Greenland. Eugene had determined our position astronomically and told us that in three days the icefloe had drifted sixteen miles.

To-day Ernst has been trying to contact radio amateurs. He achieved his purpose and made contact alternately with a Dutchman, an Englishman and an Icelander.

We've written a letter of thanks to Stalin and Molotov for the high honours conferred on us:

"Dear Joseph Vissarionovich and Vyacheslav Mikhailovich, the four of us were delighted with the news of the high honour conferred on us.

[1] Cabbage soup. [2] Siberian salmon.

Many difficulties lie ahead, but we are aware that you and the country have our welfare at heart, that the whole country is interested in us. We shall spare no efforts to justify the confidence you have placed in us to uphold the honour of the country under all circumstances. Papanin, Krenkel, Shirshov, Fedorov."

During the night Ernst contacted two Leningrad amateurs and an American amateur. He has quite a "network of radio correspondents" now!

June 30. This morning we all rose early. Ernst began tuning in the radio to listen to the *Pravda* articles transmitted from Rudolf Island, copies of which had been delivered to Franz Josef Land by the icebreaker *Sadko*. Unfortunately poor reception prevented us from hearing them. Shirshov and Fedorov have begun collecting material for a long article for *Pravda* on the results obtained from scientific work during the drift.

I went off to hack out another pit in an icepack, in which to preserve some fresh meat—a calf weighing about 100 kilograms. I was hard at it till about 3 a.m. and the sweat literally poured off me. I made an outsize "refrigerator" and hauled the calf up to it on a sledge. Then I cut the animal into eight pieces and carefully placed them inside, covering the meat with small chips of ice.

At 9 p.m. Peter proceeded to set up his 24-hour hydrological station, and we got down to the job of shifting the meteorological hut to a new spot. We got it firmly in position, made some fine struts out of a few boards and planed down the doors of the hut so that they would open more easily. After that we hauled the windmill to a fresh place, and tightened up the stays of the radio masts.

Peter has a big job on hand: he'll be working at the hydrological winch for the next 24 hours.

JULY

July 1. Peter has been up all night working at his 24-hour hydrological station.

After breakfast we all separated to our various jobs.

Ernst transmitted a long telegram to Rudolf Island on the results of the scientific observations during our period on the icefloe. We find these observations very interesting: we discuss them in the evenings, when we are all together in the tent, and over our morning tea—before we start out for our work around the camp.

Our floe is drifting southwards, more or less along the Greenwich meridian, at an average speed of four miles a day. Ever since June 5 we have been drifting in zigzags, now east, now west. On the whole, the drift of our icefield follows the direction of the wind, with a slight deviation to the right owing to the rotation of the earth.

The astronomical determination of our position is made daily by Fedorov, with the aid of a theodolite (except when the sky is overcast); the margin of error in the determination is, roughly, a quarter of a mile.

Meteorological observations are carried out four times daily, and since June 10 we have been keeping a daily log of the weather.

The average temperature in June was 2 degrees of frost. The highest temperature recorded was 1 degree below zero.

We began hydrological work on June 6, as soon as the winch was delivered to us. Since that date we have set up four hydrological stations. We have taken two samples of the ocean bed. All water samples taken from various levels of the ocean have been examined in Peter's hydrochemical laboratory; at all stations (from 275 to 600 metres) water of a positive temperature and high salinity was found.

Thus we have established that Atlantic waters, discovered in more southern latitudes by Fridtjof Nansen, penetrate in a powerful stream to the regions round the Pole and bring a considerable amount of warmth to the central part of the Arctic Ocean.

The force of gravity was determined at two points of the drift. The measurements were taken with a pendulum apparatus (land model) designed by the Astronomical Institute of Leningrad.

Eugene is now busy studying atmospheric electricity. He has set up the instruments, and now he too has gone off to work for twenty-four hours. In addition to this he is making observations on magnetic variations.

I started to take the kitchen tent to pieces. Later Ernst came to help me, having transmitted all the radiograms to Rudolf Island. After we had carried all the stuff out of the tent, we took it right down to its foundations, as it leaks all over. We spread fresh snow, trampled it down, placed boards on the snow, and over these laid three sheets of plywood. Then we re-tied the struts and hammered stakes into the ice. There was a lot of water under the snow, which held up our work considerably. At last we finished the repairs to the kitchen tent, and were free to start cooking the dinner. Soon the primuses were roaring away in the tent.

All over our icefield water is lying under the snow. Walking has become impossible, we sink in everywhere. The water has also become a serious menace to our living-tent, and I am beginning to worry in good earnest in case the tent sinks through the snow into the layer of water covering the ice. We've had to shovel snow half-way up the sides of the tent, to prevent the edges from thawing so rapidly. The result is a huge hummock, but if we don't keep an eye on it, the hummock will also turn black soon and begin to thaw, and we shall have to pile up the snow all over again.

I went out and took a look at the dumps, and examined all the equipment. It was a sorry spectacle: The snow hummocks have completely collapsed exposing the cases of goods, the rubber paraffin containers and the food supplies. This water is becoming a serious menace to all our supplies. Surely we won't have to move the station to another spot? It would be a most complicated job. There's nothing for it but to hold on a bit longer, and then decide what to do. Of course we could move over to the higher levels on our field, on to the pack-ice, and the big

ice hummocks, but that would be risky; the first serious ice jamming might throw all our stuff into hopeless confusion.

There's a fog rising, and a horrible wet snow is falling—something between fog and rain. The air is full of moisture, and the snow is slushy; difficult to walk on, one sinks knee-deep in some places.

All told we've had an unlucky day to-day. I opened a case of foodstuffs and found the contents tainted with paraffin. As each of these cases represents ten days of life for us, we shall somehow have to choke down these paraffin rusks, though we shall not think kindly of the paraffin suppliers. What happened was that the case of rusks had been used as a stand for a badly soldered paraffin tank. In spite of the paraffin taste we decided to use the rusks, as we could not afford to waste our precious foodstuffs.

July 2. This morning Peter is having a short rest after his twenty-four hours continuous work; later he intends to examine some salt water samples he has taken.

I have been compelled to sit in the shade, as the sun's rays have set up an acute irritation of the left eye; the pain is sharp, and my eye is continually watering.

The lads laugh at me:

"Look at poor old Dmitrich crying!"

As fast as I wipe away the tears, the faster they stream down my face. Who would have thought that I'd get such a "sunburn" at the North Pole!

Peter pulled my leg:

"Remember, Dmitrich, you were saying you wished you were at Matsesta[1]. Why worry? Evidently our floe can offer you just the same amenities!"

I agreed; certainly up to date, our floe has been quite well-behaved and hospitable.

"Better not criticise our floe," I replied. "It carries us along smoothly and calmly, it's easy on our nerves, and doesn't do anything to upset us; in fact it's most solicitous of our welfare."

"Just you wait, the time is yet young," warned Eugene.

That also, is probably only too true. . . .

Ernst has taken another fifteen radiograms congratulating us on the honours we had recently received. Even my old father has sent me a radiogram from Sevastopol, with instructions that I should justify Stalin's confidence.

Ernst has taken down his tent—the storehouse for technical equipment—as it was torn in places. He patched the holes with "Emalite"[2]. To-morrow the tent will have to be shifted to a drier spot, here the spare parts for the radio station may get damp.

However, the abundance of water on the floe has been useful in solving the problem of water supplies. We no longer have the bother of breaking up ice and melting it down. I have dug a well in the snow,

[1] A health resort in the Crimea (Translator).
[2] A rubber solution of Soviet make (Translator).

from which we draw water for the kitchen. This means we can have the luxury of an extra wash—in which we do not indulge often.

Peter has been recording the data of his hydrological observations. After supper Eugene started to measure on a map the number of miles the drift has carried us since May 21, the date of our landing. His scientific observations of atmospheric electricity are yielding most interesting results, but he is in no hurry to draw his conclusions.

"I must check and check again," he says. "In scientific matters more than any others, triple verifications are necessary. . . ."

I received a telegram from Moscow, saying that a Komsomol Group[1] was being formed on the North Pole Station, the group consisting of I. D. Papanin, member of the Party, E. T. Krenkel, probationary member, and E. K. Fedorov, member of the Young Communist League. I have been appointed party organiser of this group. My job is to conduct party activities among "the population of the North Pole." We have a fine bunch here—the lads are doing all they can, and working hard. We must organise a meeting in the near future, and Peter Shirshov must be admitted as a sympathiser. He has been asking for admittance for a long time ; he fully deserves it, having shown himself to be an exceptionally industrious and conscientious comrade, devoted to his work and expert in carrying it out. He's just the chap to make an intrepid Bolshevik !

July 3. A periodical "housemoving" has begun, for every day we have had to re-peg our tents. This time we started on Eugene's magnetic post. Yesterday Ernst moved to "new quarters," with all his radio equipment. To-day Fedorov is wandering around with his tent in search of a drier spot.

As compensation, however, we find things very snug in the living-tent. It's the only place left that's free from water. On every tent the snow lies in a thick crust, then begins to thaw and the water seeps through. What a summer ! In weather like this we don't feel like going outside. When we come in we're soaked to the skin, and we've nowhere to dry our clothes.

When we have to go out we put on tarpaulin coats over the rest of our clothes, but even these aren't completely waterproof.

At 7 p.m. Rudolf Island called us :

"Calling North Pole ! Calling North Pole ! Tune in ! Tune in ! . . . we are going to read to you the papers which have been delivered by the *Sadko* . . ."

Reception was excellent. We were told what articles and photographs had been published in the press, and what Moscow is saying about our expedition. Then they read us the most interesting stories, dispatches and articles. At our request they also read us a whole page of small items of general news from *Pravda*. All these latest developments give us immense pleasure, and serve as the subject for endless animated discussions. They also played some gramophone records which had been brought from Moscow. We were in high good humour when

[1] A group of the Young Communists League (Translator).

we removed our earphones. It had been almost like being at home again.

We've still a great deal to do on our icefloe in order to carry out the main programme of the Expedition. The references by Soviet and foreign scientists to our work in the Central Polar Basin have been very encouraging. The Soviet people's appreciation of the work done by the Station gives us even greater encouragement. We intend to work, as the saying goes, "till we drop."

When we were preparing for the expedition on a drifting icefloe we failed to appreciate its true significance.

It was only when Comrade Stalin stressed its immense scientific importance, that we realised how much it meant. And from that moment we made a vow that we would do everything, positively everything set out in the programme, so that our country and the world should see the great results of the work of Soviet people.

I am still studying meteorology, to assist Eugene in his weather observations, thus enabling him to devote more of his time to his primary scientific programme.

July 4. When we got up this morning Ernst had still not gone to bed. He had been on camp watch and had been contacting short-wave amateurs all night long. He had got into contact with a Czech, who was delighted to have chatted with an inhabitant of the North Pole.

The Arctic summer has finally set in. The temperature is half a degree above zero : fog, and a penetrating dampness. The once firm and glittering snow on our icefield has now turned into slush.

Outdoors the weather is vile ; wet snow falling, and water underfoot. I decided to return to the tent and start on some repairs. I fixed up the chronometer spring, and mended the drill. On a day like this one has no wish to go out. I'm taking good care that my clothes don't get soaked, as there is nowhere to dry them.

During the morning Eugene shifted all the instruments from his tent-observatory into our living-tent, then he dismantled his tent and began clearing the snow in a new spot, where it's dry. We are continually on the move !

Peter also has been putting his things in order. His tent—the hydrochemical laboratory—is collapsing. It had to be strengthened by driving new stakes into the ice. After he had finished that job Peter proceeded to lower the bathometers, but suddenly they jammed. We discovered that new ice, 5–6 centimetres thick, had formed in the hole. With considerable difficulty we managed to extract the current-meter which we had lowered to a depth of 600 metres to measure the direction and speed of the drift.

After dinner we all assembled in our polar palace. They are good lads on Rudolf Island : once again they've arranged for our benefit the reading of newspapers over the radio. We learned of the International Exhibition in Paris, heard an article about polar explorers, and then a gramophone record of the song, "Smile, Captain, Smile !"

Ernst is fixing up a microphone; perhaps we'll be able to contact Rudolf Island over the radio-telephone.

However busy we may be with our scientific work we should sometimes like a word with our friends; just to hear their voices cheers one up tremendously. Though we're far from dispirited, even so, at times, we should like an occasional respite from the rub of the daily round.

I went out to check up on the state of our "meat and fish refrigerator." I had my suspicions—Merry was making tracks in that direction far too frequently. It transpired that he had gradually dug quite a big hole with his paws in his efforts to reach the meat. Catching the culprit at this digging I grabbed him by the scruff of the neck, rubbed his nose in the hole and gave it him hot. He started howling, and ran off to the tent, where he made himself scarce for the rest of the day. My conscience is a bit uneasy; I can't help feeling sorry for Merry, but he must be taught a lesson!

We have received fresh instructions: to transmit weather reports every three hours for Mikhail Gromov's flight to America. Once again we wait impatiently: Maybe, when Gromov flies over our camp he'll drop us newspapers and letters from our families.

We try to send the reports punctually; not a single minute late. Now the sole topic of conversation is newspapers, letters, newspapers. . . .

July 5. The wind is ripping the canvas off the tents in which our reserve supplies are stored. To-day I decided to mend them. I spent a lot of time putting patches of percale over the tears, but in the process I got my hands so smothered with "Emalite" that I didn't even attempt to make flapjacks for the lads' dinner. I tried washing my hands with hot water and benzine, but it wasn't the slightest use. Eventually I had to scrape the stuff off with a knife; it was like scraping the bristles off a pig's hide.

After dinner we again listened-in at the loudspeaker to Rudolf Island. They continued with the newspaper readings. We were all touched and gratified by the leading article in *Pravda*. I think that we ourselves, out here, have underestimated the great significance which is being ascribed to our work at home and abroad.

This evening the first Party-Komsomol group meeting of North Pole Station was held. First we gave our group official status; then we discussed the plan for Party and cultural activities. In view of the immense amount of work to be done we decided to hold a meeting of the group only once every ten days to discuss current political matters. I am to be in charge of the circle. We asked Ernst to collect material on the international situation through Rudolf Island. The third item we discussed was Peter's application to be admitted as sympathiser. Peter's application was unanimously approved.

Before turning in I spent a long time going round the camp, inspecting our gear. I caught a cold in my ear, worse luck, and the pain is acute. Peter undertook to treat it and warmed up some camphorated oil.

I viewed these preparations with considerable alarm and appealed to the lads.

"I have no great faith in Peter's abilities as a doctor. What do you fellows think?"

"I shan't allow myself to fall ill till I get back to Moscow," declared Eugene, with a sceptical glance at Peter.

Peter, however, stoutly defended his "subsidiary profession," exclaiming:

"What odd chaps you are! You don't seem to realise that out here on the icefloe medicine is mainly psychological. It won't be the camphorated oil that'll cure Dmitrich's ear-ache, but the very idea that I'm treating it."

"Now you're meddling in mysticism," demurred Ernst.

"No matter what you say," concluded Shirshov unabashed, "as physician, your health and physical well-being are my responsibility. Supposing Eugene were to fall seriously ill . . . We'd have to report to the mainland, and the inquiry would immediately be forthcoming: 'which of you is the doctor?' Answer: 'Peter Petrovich Shirshov!' 'Aha my dear,' they'll say in Moscow, 'send him back here at once!' Say what you like, in matters of health you have to obey me; not hide your ailments from me. Don't be deceived because I'm kind-hearted. As a medical authority I am strict and severe."

"Long live blood-thirsty Peter!" interjected Krenkel and we burst out laughing.

Although we think Peter's first medical treatment will also be his last, nevertheless, we trust him.

Krenkel got up announcing:

"I'm off to have a chat with the world."

Which means that he has decided to pursue his favourite occupation of "catching" radio amateurs.

Ernst has made contact with a Moscow radio amateur named Vetchinkin, his first direct radio contact between the North Pole and Moscow.

July 6. When the time came for preparing dinner I was glad to think it wouldn't take long to cook, as we could use all yesterday's leftovers. The meal only needed heating up, with some water added to the milk pudding, to thin it down. I added sausages to the borshch; the cranberry jelly was quite all right. Then I quickly fried some flapjacks in butter, and we all ate heartily.

It is exactly a month since the heavy planes which brought us to the North Pole flew back to Rudolf Island and left us alone on the icefloe.

Eugene is working day and night studying magnetic variations. Peter is checking the bathometers, lowering them to various depths on a cable, and verifying the thermometers.

We listened to Rudolf Island reading out articles in *Pravda* and *Izvestia*.

Not a day passes when we fail to put in at least fourteen to sixteen hours work, sometimes even longer. But that is as it should be. Often when I return to the tent I just throw myself down on a fur rug; my arms ache, and I have no strength to write. If I did not make a special effort I would go straight off to sleep. But there's no time for sleep;

we must work and go on working ceaselessly without rest. Only in this way shall we achieve all we have planned, and carry out our full programme of scientific observations. To-day, however, directly we gulped down our tea we all crawled into our sleeping-bags.

July 7. To-day I soldered the pipes of the distilling apparatus in Peter's laboratory, and connected the conductors of the radio station. After that I spent a long time carting snow on a sledge. By dinner-time I was so exhausted I had to force myself to prepare the meal.

The dinner was tasty: Pea soup, noodle pudding and cocoa. We are fed up with the "paraffin rusks," but have still enough left for three or four more days.

Peter has been busy all day determining the drift, lowering two current-meters simultaneously. I am still working on the construction of the "Moscow-North Pole" canal, which will conduct the water away from the living-tent to the hole. I shall have finished this "hydro-technical" job by to-morrow.

We are starving Merry to-day and keeping him tied up. Once again he is being punished for stealing meat. This is how we discovered it: Ernst offered Merry a piece of sausage, but much to our surprise the dog refused it. It transpired that Merry had already eaten his fill illegally; although he is tied up, he still tries to make a fuss of me, guiltily wagging his tail. Ah well, I'll keep him tied up as a punishment for one more day, and after that I'll let him have his freedom.

July 8. Eugene made astronomical observations and computed that we have been carried four miles to the south-east.

Reception to-day was so bad that we were hardly able to hear anything coming over from Rudolf Island.

Peter continues his observations with the current-meters.

We're having very good weather.

July 9. Eugene has again made astronomical observations and set up the electrometer. He has taught Ernst and myself to make these observations and record the figures.

Every day there's some kind of mending job for me to do, soldering or repairing instruments.

To-day I tightened up the slack guys of the windmill—the silk ropes stretch quickly. We take great care of our windmill. It could hardly be otherwise—the windmill is our most essential machine. If anything happened to it we could only give news of ourselves by radio once in five days.

We can't place too much confidence in the motor as the reserves of petrol are very small—only 500 litres all told.

I sent a sharp telegram home; it is ten days since I've had any news from my wife. I'm worried—I hope Volodichka isn't ill.

July 10. Peter and I made a tent out of a big parachute. We finished it at midnight.

Ernst has tuned in to an interesting concert at some foreign station. Krenkel warns us that listening to good music is often dangerous in the extreme North; too strong a reminder of the mainland. I daresay

this is true ; nevertheless we listen with great concentration, and enjoyment though we can't always make out all the words of the songs. At the moment, I think, it's an English broadcasting station.

The long-awaited telegram from Volodichka has arrived. Everything at home is all right.

July 11. I helped Peter establish a hydrological station at a depth of 4,000 metres. This job took us all day. This evening I was too tired even to write down the entries in the diary. I lay down on the skins and dropped off right away ; slept like a log. My heart has started playing me up lately ; I had to take some drops.

The previous night Ernst and I had discussed till 2.30 in the morning how best to look out for Gromov's plane ; Moscow has informed us that he is taking off on July 12 at 3 a.m. We're in a great state of expectancy and hope that he'll drop us newspapers and letters.

July 12. Spent a wakeful night.

"Gromov ought to be taking-off soon," I said to Ernst.

Krenkel removed his ear-phones and moved closer to me.

"Hope we don't miss him !"

"Perhaps it would be better if a bit later on we all separate and watch at different points of the floe. . . . Or how about arranging several look-outs ? What do you think ?"

"If Gromov feels like making a detour, of course, he'll find us. . . . Still it's very doubtful : why should he fly off his direct course, when he has to consider every kilogram of petrol ?"

"Why don't we walk over the ice towards the North Pole and watch his flight from there ?" I asked half-jokingly, half-seriously.

"That great trek might come to grief," remarked Krenkel.

You think up anything to get a peep at your countrymen, even when up in the air, or to receive news from Moscow.

I voiced my opinion :

"I think we ought to be on our toes all the time, keeping a look-out. You Ernst, take care of the ether, we'll take care of the sky. You never know what might happen. We mustn't let Gromov's flight catch us napping."

We've received a most gratifying telegram from Academician V. L. Komarov, President of the Academy of Sciences of the U.S.S.R. We sent him an answer straight away.

July 13. This morning we all rose at 6 a.m. and started getting ready to keep a look out for Gromov's plane. Our wives informed us that they had given him letters for us. My thoughtful Volodichka had even prepared a small parcel of cucumbers and oranges for me, but she was talked out of sending it. I wouldn't say no to a nice fresh cucumber at this moment !

We're making every effort to guide Gromov's plane to our camp. We mixed some dye in a big can. Peter and Eugene sinking knee-deep into the water, drew an exact circle and then coloured it. I cooked a quick meal and after everyone was fed also lent a hand in colouring the circle.

Ernst slept. He'll have to be on duty right round the clock, following

the plane's flight by radio. Peter and Eugene came back soaking to the tent, which immediately became noisy and crowded.

"What a cursed summer!" exclaimed Eugene angrily.

Ernst transmitted the routine weather report to Rudolf Island.

We heated three buckets of water, mixed the colour in it and went off again on our colouring job. Our floe will looks as merry as a nursery playground, with bright yellow circles for games. . . .

Meanwhile Ernst sat in the tent with the ear-phones on. He heard the transmission from the plane while it was still in the vicinity of Kolguyev Island. From then on, things began to hum.

Suddenly, Ernst shouted: "The plane is calling us!" and immediately started taking down a radiogram.

"Greetings to Papanin, Krenkel, Shirshov, Fedorov, conquerors of the Arctic. Gromov, Danilin, Yumashev."

Krenkel replied promptly:

"Reciprocatory greetings to our Soviet eagles."

We felt slightly suspicious—why should they send greetings. Can it be true that this plane, too, is not going to fly over us, is not going to drop us even a single pennant? . . . And what about our precious letters? . . .

Leaving Ernst at the radio station, three of us armed with field-glasses went out and started raking the skies in all directions; Peter put on his skis, went a short distance and climbed on to a huge mound of pack ice. I took up a stand on the other side. Eugene stood by the theodolite, ready to perform his duties as sports commissar and to register the flight of Gormov's plane over the icefloe station, "North Pole."

It was long past the time when the plane should have arrived, and still the skies were clear. Sadly we realised that Gromov was flying on the direct route—over the Pole to America. Our disappointment was intense.

Vexed and upset we returned to the tent, having lost all hope of getting the letters and newspapers. But all the same we argued soberly: why the devil should Gromov lose time, by making a detour of practically 200 kilometres, to look for us, when he has been entrusted with such a great and responsible task!

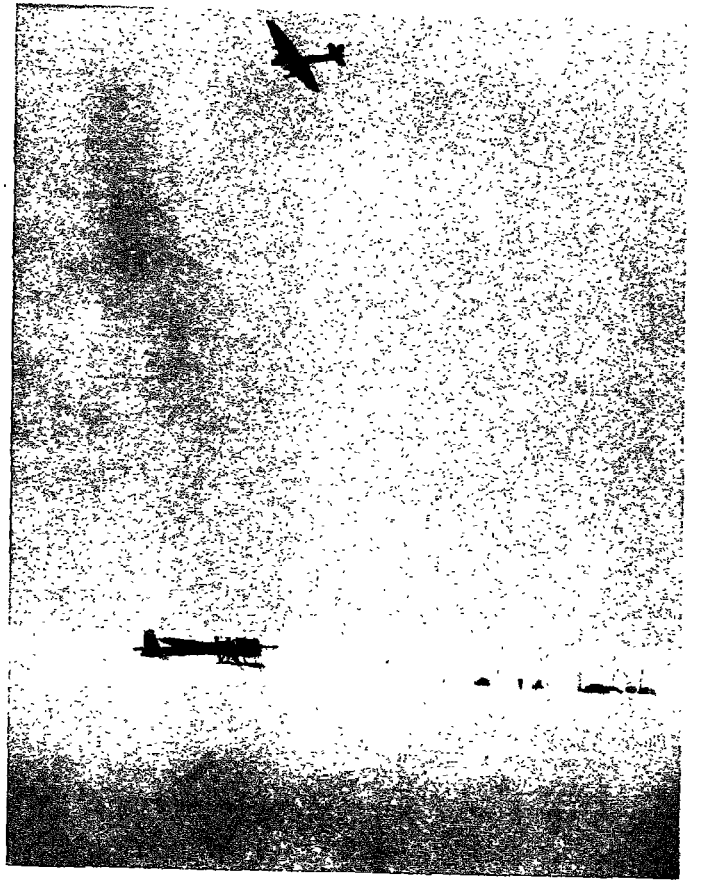
We sent Mikhail Mikhailovich and his comrades our wishes for a good journey and a safe conclusion to the flight.

Then we lay down to sleep, all except Ernst, who still went on working at the radio station, as if it could make up to him for the letters from home that had been flown off to America.

July 14. This morning Peter went off to work in the hydro-chemical laboratory, and afterwards started making preparations to take a depth sounding. We went out to the hole. Vast blue lakes may be very pretty; but I'm sorry to say, we're not in the mood for contemplating prettiness at present.

Drawing up the lead from a depth of 4,000 metres is an exhausting and difficult job. This extra physical work tells on us. However, the

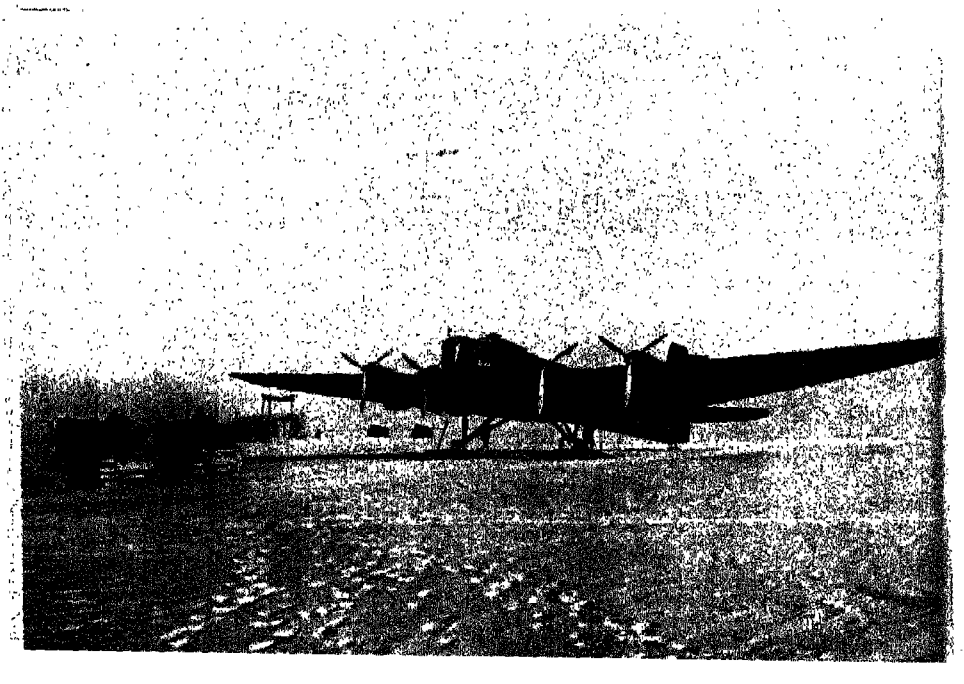
On the way to the North Pole. Plane flying over the permanent ice barrier



Alexeyev's plane arriving at the Pole with stores for the station

Vodopyanov flying his plane

On Rudolf Island—tractor towing a loaded plane



course of scientific work can't be altered: during the course of our drift we have to make regular soundings of the depths of the Ocean and to carry out hydrological, gravitational and magnetic observations.

This time the depth was 4,150 metres; but as there was no soil in the scoop, we doubted if the lead had touched bottom. Peter thinks it did. Still just in case, he'll check the depths once again.

After a short rest Ernst went on night watch. During the watch he wrote an article on our life and work on the floe. After that he hauled away the goods from No. 2 dump which were in danger of getting wet. I'm glad he's doing some physical work. I worry a great deal about Ernst; I'm afraid of a recurrence of the scurvy which so seriously undermined his health during the last winter he spent on Severnaya Zemlya. Ernst's job is a sedentary one and I notice that he always seems to be sleepy. I only hope he doesn't get the scurvy. It would upset all our work.

Daily at dinner-time each one of us takes three anti-scurvy tablets. But the tablets aren't enough; we must do as much physical work as possible. That is the most reliable safeguard against scurvy.

July 15. Peter is lowering the bathometers to a depth of 1,000 metres. He is establishing this station, and during the night he will analyse the samples of water he has already drawn.

All day Eugene was busy measuring the force of gravity. He made an astronomical determination. Our position is 88°8′ N. Lat., 2° W. Long.

I have had to work at No. 1 dump, which is also flooded. I had selected for this dump a good, dry spot in the snow. As soon as I untied the coverings, which had been wrapped quite tightly around our supplies, down tumbled the cases of butter and the tins of sugar, and in dragging them out of the soft melting snow I got my feet very wet. I began to feel horribly cold, with a chill coming on, but I went on working; altogether I carried more than a ton of supplies in my arms to the new spot; then I opened the sack of felt boots, inside which were packed excellent anti-scurvy specifics—onions and garlic. True, some of the vegetables had frozen, but those that are sound will be of great help in preventing scurvy.

Later I helped Peter to draw up, with the winch, the cable to which the bathometers were attached. Then I mended my bunk as the cords had broken, and it was uncomfortable to sleep in.

After midday the weather got a bit colder, though the temperature is only 1 degree below zero. If only this rapid thaw would hold off a little!

July 16. I slept very soundly for five hours during the night—"just about three hundred minutes," as Ernst says. I enjoyed my breakfast, though the menu to-day was very modest: buckwheat porridge, tea and rusks.

Peter and Eugene are very busy all the time with scientific work. They have very few hours left over for sleep. They never sleep more than six hours a day.

Ernst lay down to rest after breakfast, but was unable to sleep:

it was an exceptionally fine day, and the sun had warmed the tent so well that inside it was actually hot.

We are very pleased : our weather reports have assisted the flight of the gallant Soviet airman over the North Pole. The Soviet traffic-lights are now lit at the crossing of all the meridians ! A hearty welcome to all !

July 17. Peter was busy taking a depth sounding. He fixed up the winch, cleaned the brake and started to pay out the scoop to draw up a sample of the sea-bed. This is very timely, for I have had a request from Moscow to supply information for the International Geological Congress regarding the sea-bed in the vicinity of the North Pole.

The sounding showed the depth to be 4,395 metres. Thus the ocean-bed along the course of our drift so far continues to slope downward. We wound up the winch ; all working for four hours without a break. Though the wind was blowing and it was cold and damp, at times we had to take off our coats, the work made us so warm.

After dinner Peter lowered the current-meter to obtain some data regarding the drift ; during any free moments he carefully puts the samples of sea-bed soil into cellophane packets, to bring them safely back to Moscow later.

Ernst and I are learning from Peter how to do hydrological research work in order to help him as much as possible.

During the night Ernst transmitted some material to Moscow for the International Geological Congress.

I haven't been feeling well ; I vomited and have a headache.

July 18. The blizzard is our scourge ; it smothers our gear with snow, covers up the trampled paths to our tents and dumps, and causes an immense amount of extra work.

Ernst has contacted a Dutch wireless amateur. The Dutchman told him : "To-day our newspapers have published the weather report from the North Pole. If you want to transmit anything to Moscow I am at your service . . . By the way do you know that your airmen have broken the world's long-distance flying record ?"

Ernst proudly answered :

"Of course ! We supplied them with the weather reports."

We have discovered new phenomena on our icefield. Towards dawn there was considerable jamming of the ice. Later we saw a tremendous ice ridge 8–9 metres high and nearly 100 metres in length, which had been thrown up on our icefield during the jam.

However this sort of thing no longer orries us. Our surroundings have become quite commonplace and we have grown familiar with and well adapted to local conditions. Our whole mode of living is subordinated to one basic requirement : to carry out the greatest possible number of scientific observations.

July 19. The expedition's reserve stock of alcohol has been left behind on Rudolf Island. But Peter has succeeded in solving the problem of obtaining alcohol for the preservation of hydro-biological specimens ; he distils it from brandy ; from one bottle of brandy he distilled 500 grammes of pure alcohol.

I spent all day operating the current-meters, raising and lowering them four times.

Dinner was easy to prepare: rice soup—left over from yesterday; for the sweet course, noodle pudding, to which I added water, five lumps of sugar and a pinch of powdered milk. The only thing that had to be freshly made was the cocoa. To cheer up the lads I cut them each a piece of cake. They are a bit fed up from the continual rain and wind. Everywhere the water is knee-deep. Even in the living-tent this vile dampness hangs about. The remarkable thing is that nobody complains: instead, we crack jokes to show we're in good spirits. If any one of us feels depressed, he gets over it alone, and doesn't spoil things for the rest of us.

After the meal was over I put on my skis and went off to examine our icefield. On the southern and eastern sides there are beautiful ice hills, thrown up when the ice was jamming.

To-morrow, Peter and I intend to lower a series of bathometers to the bottom layers of the ocean. The last station we established showed that the water at these levels had a higher temperature than that of the middle water mass. This will have to be verified thoroughly.

At first all scientific observations were complete novelties to us, frequently running counter to academic theories; now our scientific work has entered upon a new stage: Our young scientists Peter Shirshov and Eugene Fedorov having noted the peculiarities of the region, and drawing their conclusions with a greater degree of accuracy, are making additional observations.

July 20. To-day's activities have reminded us of life on the continent before a big holiday. As soon as Ernst had transmitted to Rudolf Island the data of his routine weather observations we all assembled in the kitchen. We got a big bowl of water to wash our heads in, and brought out the razors . . . It's a month since we last shaved, and the last time we washed our heads was before we took off from Rudolf Island.

Eugene shaved my head, and poured warm water over it. I gave myself a good wash—the best one can get in our conditions. We shan't have a real bath again for another year. We'll only wash once a month, like to-day.

Peter and I drew up the bathometers from a depth of 4,000 metres. It has been definitely established that the layer of water near the ocean bed is slightly warmer than the water at a depth of 2,000–3,000 metres; the reason being that the water near the bottom is warmed by the heat emanating from the earth's crust. This is the first time this discovery has been made in the Arctic Ocean. Then I went off to the storehouse, got out some clean underwear for Ernst and myself and returned to the tent, where I changed, and discarded my ancient socks; worn for two months. I might add we were most reluctant to part with our old underwear—we had got so used to it. Never mind, we'll soon get our new underwear broken in!

We've had a telegram informing us that the film "At the North Pole" is ready, and has turned out well.

I'm always feeling sleepy, we're having to spend eighteen hours a day on our feet.

It seems as though the modest parcel of books we brought with us is fated never to be opened—there just isn't any time for reading. However, the entire population of the Pole is leading a very full and varied life.

July 21. It's a holiday to-day, a day of rest: we've completed the second month of our life on the icefloe. However, despite our holiday mood, at the usual hour we transmitted to Rudolf Island the materials of our scientific observations.

Peter and I took a long time crawling out of our sleeping-bags; our bodies ached terribly, especially our arms—the result of constantly turning the winch. After dinner we all assembled in the living-tent, and stretched ourselves out on the skins. Ernst put on the gramophone. We listened to all the records; we particularly enjoyed Leonid Utesov's Jazz Band.

In the evening Rudolf Island transmitted newspaper articles for us.

At last we've opened the parcel of books. I immediately became engrossed in Bredel's "The Test" and read far into the night. I've had a good rest, and feel the better for it. To-morrow work starts afresh!

I opened a tin of sugar and discovered that it contained 160 "Mishka" toffees. We divided them up equally, 40 each. The lads carefully stowed away their toffees beside their bunks. These sweets will last them several days; as for me, I haven't got a particularly sweet tooth.

Peter brought in the anemograph. The wind had blown it down and damaged it a bit. I'll mend it to-morrow.

It had already turned midnight. When Ernst had finished transmitting the weather report to Rudolf Island, he carefully examined the tin in which we keep tobacco and cigars. He handled the cigars as gently as though they were valuable fragile instruments. He took them all out and divided them equally with me, as the others don't smoke.

The time is now 2 a.m.; time to turn in.

July 22. For a week now the weather has been completely calm; we are in the zone of an anti-cyclone. The absence of wind has compelled us to stop all the newspaper articles we transmitted over the radio. The fog is preventing Eugene from carrying out astronomical observations to determine the position of our icefloe. The thaw continues, and I view with anxiety the deep lakes which have formed on the floe.

This morning I have been repairing the primus-stove burners. I simply cannot understand what's wrong; none of them last more than ten days. I tried to bake them; Ernst took over the job: when a boy he used to work in an engineering repair shop.

Eugene has pitched the tent for magnetic observations on a new site. He spent all day on the job, and then took three hours calculating the data of earlier observations.

Peter was busy at the hole in the ice, studying the drift. Once again there has been a jamming of the ice. When I went to inspect the "meat and fish refrigerator" I discovered a huge floe standing on end on our icefield.

I never seem to get enough sleep; unless I get sufficient sleep I don't feel fit. Through over indulging in cigars I feel like a drunk.

Still, I manage to snatch time off for reading—I've nearly finished "The Test". How difficult, dreary, and hopeless is the lot of the working man in Hitlerite Germany.

July 23. It was late when Ernst turned into his bunk after his watch, for he too had got his nose into a book.

Eugene was busy all the time making calculations. He's upset as there has been no sun since July 16 and he is unable to determine the position of our icefloe.

Ernst didn't get up till nearly evening. This time I had to wake him, as it was his turn to cook the dinner. He had hardly opened his eyes when I said to him:

"Get up Ernst, you've got some cooking to do!"

"Don't worry, I shan't oversleep."

Ernst is a very sound sleeper. He hardly manages to get into his bag than he is asleep. Nor do the others complain of insomnia. As for me I always start thinking before I go to sleep. A thousand and one plans are always buzzing in my head.

Ernst has at last gone to cook the dinner and in fifty minutes he managed to cook three courses: for the first course there was pea soup with a strong smell of paraffin. We were quite unable to finish this strange culinary phenomenon. I added two teaspoons of brandy to my bowl, which made it absolutely uneatable. . . . We had an omelette for the second course; as for the third—we none of us knew what we were eating. Ernst had concocted a new dish, made of milk, eggs, sugar and brandy, and gave this mixture the high-sounding name of "egg grog." However, much to everyone's surprise it turned out to be very palatable.

I have made a basin out of a can for the hydrological work. I cut the can in half, turned the edges up and soldered on two handles.

I've been thinking a lot of Volodichka to-day. She is a real comrade and friend. We'll live our life together, and if war does come, we'll join up together.

Peter is still working at the winch lowering the bathometers.

July 24. I took a sledge and brought the engine over. Ernst and I hauled it off the sledge and fitted it up.

Ernst then fixed up the wires, extending them outside the tent, and I revved up the engine, as our accumulators show hardly any sign of life. We ran the engine for an hour and a half. The transmission of weather reports is now assured for the next two or three days, and by then perhaps the windmill will start turning; if the "God of the Arctic" i.e., the wind, helps us out.

After this we tested our rubber fleet: we lowered our polar launch into the water—the clipper boat—and found everything in order.

In the plankton net we drew up a small quantity of medusae and crustacea from a depth of 1,000 metres. In the upper horizons at a depth of 250 metres, living creatures were found to be more numerous. Altogether the lads are now spending a lot more time working up the scientific

results. The work has yielded good results : we have established hydrological stations, determined the force of gravity, made magnetic measurements ; we have also succeeded in recording several magnetic storms, and have caught all kinds of fauna inhabiting the ocean.

Quite near the living-tent a stream has formed, which is washing away the ice. We have had to build a semblance of a bridge over this stream. But the boards bend beneath our weight as we walk ; every time we cross it we are in danger of falling into the water, and we have nowhere to dry our clothes. So I got down to the job of strengthening it.

To-day Eugene at last succeeded in making an astronomical determination. Our position is : 88°03′ N. Lat., 6° E. Long.

We did not waste the fine day, and in the intervals between jobs we took some photographs. We shall have to hurry up with this work before the polar night sets in, when it will not be possible to take photographs. Yet photographs are essential ; for many years they will serve as a documentary record of our life and work.

The editors of *Pravda* have sent us a radiogram to-day, in which they give us the Moscow news. It was very pleasant to hear how our dear old capital is developing and becoming more beautiful.

July 25. After breakfast Ernst and I hauled snow. We placed two large sheets of plywood on a sledge, loaded it up with as much snow as it would take, and then hauled it to the kitchen and the living-tent. After three hours' work we got so tired that our eyes were absolutely bulging. No wonder—every sledge-load of snow weighs about thirty poods[1].

Peter lowered seven bathometers to various levels up to 4,000 metres.

Once again we tackled the terribly exhausting job of winding the winch to raise the lead.

Eugene spent all day checking the instruments for measuring magnetic variations. In addition to his own scientific work he regularly carries out the meteorological observations.

Ernst, also, has plenty of work to do. Eugene woke him to send the routine weather report to Rudolf Island. Krenkel tossed and turned for a long time, looking out of surprised eyes, and then, when he understood what was required of him, slowly got up.

There were two of us at dinner, Peter and myself.

After dinner I soldered the paraffin lamp and took it into the tent to check up how much warmth it generated and how long one filling of paraffin lasts.

I can't be bothered to finish writing up the diary : I'm so tired I can hardly keep my eyes open. . . .

July 26. The first frosts, which we welcomed with such pleasure, didn't last long.

The weather is miserable : fog, drizzly rain, the outside temperature 4 degrees above zero. The ice is again thawing rapidly. Our living-tent is in danger. The canal, along which the water drains off to the hole cut in the ice, had deepened to 60 centimetres. It is not even safe now

[1] 1 Pood = 36 lbs. (Translator).

to walk to the tent over the boards, because of the danger of falling into a wide polynia.

Eugene has gone off to his laboratory to work up the materials of his observations.

We are having a lot of trouble with the hydrological hole in the ice, into which the water from the surrounding lakes pours in a raging torrent. A whirlpool has formed, which is washing away the sides of the hole cut in the ice and endangering the winch. Peter is taking great pains to strengthen the walls of the hole. At the hole the pressure of the water flowing from two directions is so high, that Peter is afraid of losing his precious winch. He is building an elaborate structure of boards, pieces of plywood and poles. He worked till dinner time on it. However, the winch we now hope is safe.

I went to have a general look round and see how the water is flooding our icefloe. At one place a waterfall has even formed; anyone falling in here would never be able to get out. We must photograph our "Niagara Falls."

We are already preparing for the polar night. Though it won't be setting in for another month yet, it is not too soon to put all our gear in proper order. I got out all the glass chimneys for the paraffin lamps, unpacked the cases of equipment, got out the lamps and lit them, to check up on the amount of paraffin they consume.

All these careful preparations evoked a great deal of talk and reminiscences concerning the polar night. . . . Each one of us had spent some time in the Arctic during the period of polar darkness, but then we had lived at a polar station in strong well planned wooden huts built on solid ground.

On this occasion we have to spend the polar night on a drifting icefloe.

"This is the first time I've done such a thing in my life," remarked Eugene and the thought occurred to me that his life was not all that long.

I then told the lads what my personal experience of the polar night had been:

"All I want to do at the beginning of the polar night is to sleep . . . Later I get used to it, I discipline myself, and everything proceeds normally. I suppose it will be much the same this time, on the floe. . . ."

"It isn't the polar night so much," remarked Ernst, "as the situation itself: we'll have to keep on the alert all the time, which is a far harder job in the dark than in the daylight.

"In the polar night the first sign we'll have of the floe breaking up will be when we hear it. It will be difficult even to find the dumps, which will have to be saved. . . ."

"Well, I don't think things will get to that pitch if we make a more careful daily inspection of the floe," I said. "Naturally, during the polar night we'll have to be trebly vigilant and alert. Broadly speaking, so far as the polar night is concerned, it is my opinion the devil isn't as black as he's painted. Like everywhere else in the Arctic, we have the moon; there won't be total darkness. Besides, we have the hurricane lamps."

"Of course, Dmitrich is quite right," agreed Shirshov.

At this point our talk on the polar night came to an end. But it taught me that the lads do sometimes think about the serious hardships that await them here, and it convinced me that they are all completely prepared for these trials—which is as it should be.

I strapped on my skis and went off to examine the "refrigerator"; Merry's behaviour has again been suspicious: Towards morning he broke loose and kept careering around the camp. However, I found no dog tracks around the pack ice. Later I had proof that the artful thief had got into the storehouse, not by the usual way, but from the other side of the camp where he had dug three holes. However, he failed to reach the meat. I blocked up the holes with ice and snow and returned to the tent. Merry seemed to know that he was in for a good hiding, and hid himself under a sledge. I gave him several strokes with the rope-end and left him without food for a day. I really cannot understand why our dog has such a craving to steal food; we feed him well; he gets as much as he can eat!

Everywhere on our icefield there is water; the only way of visiting our dumps is by clipper-boat. I made quite a journey in this rubber boat, inspecting the state of our floe. I have discovered that there was only one small "dry" little island left on the floe, and even this is in danger of becoming flooded.

Like a miniature icebreaker, our boat nosed her way through the small floes which float on the surface of the lakes. At times I forgot these were not deep polynias, but lakes with ice 3 metres thick underneath them. Finding I had covered quite a distance I decided to return; as we know water leaves no track and it is easy to get lost in the fog.

Peter obtained a sample of plankton from the ocean, and spent a long time examining it in the laboratory; afterwards he, too, set out in a canoe to sail the newly formed "sea" on our floe.

The thought occurred to me that even if they wanted to take us off by plane, nothing would come of it: there is not even a field 100 metres long which could be used as a landing ground, and the floods on top of the ice are so deep that we can sail freely everywhere, even in a keel-boat.

To-night, before we turned in Ernst switched the loudspeaker on to some music: we could hear the Paris radio station broadcasting the "Marseillaise" very distinctly.

July 27. To-day Eugene busied himself making precise magnetic determinations. As this work demands the recordings of two instruments to be compared simultaneously, Ernst came to Eugene's assistance. Eugene worked the whole day at it.

Peter again spent a lot of time on his winch; he made it fast by fixing boards all round it.

I tidied up the general store-house.

A light breeze sprang up in the morning and we were able to charge up the accumulators a little. For ten days we had no wind and were unable to transmit articles to the papers or send the briefest message

home. However, we have all sent off radiograms now to our "old girls."

During the day Peter and I went off in a canoe to examine our floe. We went a long way. Only once did we have to get out and carry the canoe across the ice, for a distance of 20 metres; everywhere lakes have formed, linked up by "straits," the whole forming a "sea." We took some interesting photographs.

After dinner Ernst hopped into his bunk completely exhausted; he had been on watch all the previous night, and in the morning had helped Eugene.

Peter has begun an examination of the data of the station. He is making distilled water, and setting out the chemistry apparatus. To-morrow morning he will titrate all the samples from the complete station which he set up three days ago.

Eugene is now keeping a diary in which he regularly enters the day's events.

July 28. This morning we rose at 6 a.m. Eugene went off to carry out meteorological observations, and Ernst transmitted the weather report to Rudolf Island.

The weather is terrible: wet snow, a biting wind, and fog. Ernst, however, is pleased: the wind has started our windmill turning, which charges up the accumulators. Now Ernst will be able to "roam" the ether in search of radio amateurs. These lords of the ether are kept well informed of our drift.

The rapid thaw has in one night wiped out Peter's work, and the winch is again in danger. Once again he has had to put up supports. Boards, plywood, sticks, lumps of ice, and rope were all pressed into service.

After midday a sharp wind set in; its velocity reached 4 metres per second; our eyes began sparkling with pleasure; our accumulators will have their fill, and we shall not need to restrict ourselves in the sending of radiograms We each sent one article to our newspapers.

By the evening the force of the wind increased to 7 metres per second. Better still!

Peter has lowered the current-meter to make observations of the drift. The drift has carried us for a considerable distance in a south-easterly direction.

The weather to-day is so bad that we none of us have the faintest desire to go out: heavy rain is falling, which has washed away the snow we piled up around the tent; we shall have to pile it up once more.

To-day Merry has renewed his attempts to get to the meat store. This is his third try!

July 29. We don't even feel like putting our noses out of doors; the snow falls in huge flakes, wet and horrible. It is impossible to work without a raincoat. The only good thing about the weather is the wind, which feeds the accumulators.

Peter worked at the winch. Every other hour he lowered a current-meter to varying depths, and determined the current at all levels. In

all, he spent fourteen consecutive hours on this job. I helped him, paying out the cable on the winch. Peter keeps a primus burning continually to heat water; each time before lowering the current-meter he has to pour boiling water over it, as when the meter is lowered into the hole where he does his hydrological work, the fresh water accumulated there penetrates into the mechanism, where it freezes up immediately it reaches sea water of a negative temperature.

There has been an accident to-day; luckily it had a relatively happy ending. . . . After I had drawn up one of the current-meters, Peter wrote down the entries in his book as usual; then he bent down quickly to loosen the stopper of the primus, which had been overcharged, the primus was filled with a mixture containing half paraffin and half benzine. Directly Peter loosened the stopper a fierce flame shot up and he cried out, covering his face with his hands. I rushed to his aid, greatly alarmed, thinking he had hurt his eyes. It transpired, however, that the stopper of the primus had kicked back and hit him on the forehead.

He quickly sponged his face with alcohol. The burn caused by the hot stopper was not as bad as the pain from the blow. His forehead started bleeding but Peter wiped away the blood with a bit of rag, and went on with his job.

It just shows how careful we have to be in our circumstances. A trivial mishap like this might have disabled one of the four members of the expedition engaged on fundamental scientific work.

The wind continues its helpful work. The temperature has fallen somewhat: zero. The pressure of the water in the hole has lessened, but big lumps of snow are being driven into it from the numerous lakes. We do nothing but clear the snow out of the hole.

After breakfast Eugene checked his instruments, then sat down to draw a general map of the drift during the whole of our stay on the ice. He only interrupts this work to carry out the routine meteorological observations.

Ernst is sending out radio signals, not calling any particular station, but anybody who may hear him.

2 p.m. Europe is now at work, America asleep, but "radio sloggers," as Krenkel calls the radio amateurs, are on the air.

He fiddled about for a long time then suddenly, just like a child, shouted out gleefully:

"I've made contact!"

He had been heard by an American in the Hawaiian Islands. Ernst then proceeded to converse with him. This man had read about our expedition in the newspapers, and was delighted to have contacted us. In Honolulu, he told us, it was sunny, there were no clouds; it was warm, the thermometer standing at 80° Fahrenheit. . . . After they had talked a while Ernst and the American wished each other every success, and the American kindly asked if there was anything he could do for us. Ernst just as kindly thanked him for the offer.

Barely half an hour had elapsed after this talk, when Ernst contacted someone else—a short-wave amateur in South Australia. Since our

station has only a capacity of 20 watts, i.e., less than the power of an average electric bulb for a table lamp, we think a record was set up by the North Pole contacting South Australia.

Ernst, of course, is in the seventh heaven of delight. His one regret is that the transmitter has no hands—he would love to shake hands. . . .

After turning in I stayed awake till 2.30 a.m. I was reading Alexei Tolstoy's "Peter I."

We are most disappointed that poor reception prevents our hearing "Latest Radio News" from Moscow, for this means we have no material for our circle on current political affairs. However, we hope that in a month's time, when the polar night begins, reception will improve and we shall be able to hold good classes. We must keep abreast with the inhabitants of the mainland.

July 30. While Eugene was taking our bearings we speculated as to where we had been carried to in the five days since the last observations:

I expressed the view that we were now at latitude 87°54′.

When Eugene had finished his calculations I was found to be only 1′ out: our station is at Lat. 87°53′.

Since the morning Peter had been studying the drift with the help of current-meters, and in his spare time he has worked up the data of his observations.

Eugene was busy all day making computations, preparing materials on the two-months' drift of our floe. He and Peter compared the scientific data they had obtained with the work of Nansen and Sverdrup.

I went out to the dumps to bring back part of the cargo, but was unable to work as my arms ached so badly. I recalled that a few days ago I was carrying snow for piling up round the tent. Shovelling up a huge lump of wet snow I staggered with it to the tent—having great difficulty in getting it there—and as I flung it off the spade I felt a sharp stab in the elbow. When our doctor, Peter, examined my arm he told me I had strained the ligaments, and painted the affected part with iodine. He warned me not to lift anything heavy for a few days, to alleviate the pain. Now I am on the sick list and only do light work.

We have received instructions from Moscow to make ready for servicing Sigismund Levanevsky's long distance trans-polar flight. Ernst is in for another tense time.

July 31. Ernst woke Eugene: the sun had broken through, and it was possible to start on the 24-hour series of gravitational observations.

Listening-in to the morning review of the press, Ernst learned that the Japanese have occupied Peiping. A big war is going on between the Japanese Imperialists and China.

Once more I went out to inspect the dumps. At No. 2 dump everything had collapsed: the spare engine had fallen out from under the percale, a slab of butter lay on one side, cases of food, each weighing 44 kilograms, were scattered on the snow just like toy bricks. I took a photograph of the general disorder. Then I chose a new site and proceeded to shift all the stuff; in one hour I had shifted more than a ton.

Ernst has again contacted his "old chum," the radio amateur in the

Hawaiian Islands. He told him that the foreign press say we are in danger; that the floe has completely melted away. He even knows such details as our having to bring snow in from some way off to pile up round the tent. . . . We set his mind at rest. Ernst "tapped out" that our drifting station is not in the slightest danger.

A sharp change has taken place in the weather. In the morning the sun was shining and there was a slight frost of nearly 2 degrees. Now the temperature has risen to half a degree above zero. It is raining heavily, a good thing our living-tent is waterproof.

Peter and Eugene have summed up the results of our two months' work and are sending articles to the newspapers to-morrow.

I came back from the dumps soaking wet. I had been working in my fur shirt and had sweated heavily; steam was rising from me as from a well stoked boiler. After a rest I read Chernyshevsky's "What to do?"

During the evening I frequently left the tent to inspect the camp. The wind has increased and the edge of the ice is beginning to break up. We must keep our eyes open, in case heavy ice pressure should cause another big fissure in the floe. That would be dangerous.

Peter went off to lower a current-meter. To-day's drift is most interesting, it has carried us back to the north-east. Surely we cannot be returning to the 88th parallel?

Eugene has been writing an article for *Komsomolskaya Pravda* about our radio station: how it was made and how it works: he said it functioned admirably.

Ernst is tidying up the kitchen and handing over its management to me for fifteen days: until August 15 I am to be "on galley-duty," as they say in the navy.

So, July, the Arctic summer month, has come to an end. What has this month brought us? We are able to record two stages in our drift: during the last ten days of May the movement of the ice showed an average speed of 4 miles a day, the direction of the drift being mainly southwards, along the Greenwich meridian; in June and July the speed decreased to 1½ miles a day. During July the layer of snow, which was as much as 40 centimetres thick, melted away, forming huge lakes of fresh water.

This month (July) Eugene began studying magnetic variations. Peter established five hydrological stations.

In the last ten days of July we have observed an appreciable development of vegetable plankton in the upper layers of the sea; apparently this denotes the beginning of the hydro-biological spring.

AUGUST

August 1. We have had a very disturbed night. Ernst was on camp watch, and at midnight he transmitted to Rudolf Island the routine weather report and a long article by Eugene for *Komsomolskaya Pravda*.

All this time our guard and friend Merry kept up an incessant agitated barking, but Ernst paid no attention, as Merry has fallen into the habit of barking either at the windmill when it turns, or at the birds on the rare occasions when they fly past our floe.

At 3 a.m. Ernst left the tent to see what was going on outside; suddenly he rushed back again shouting wildly:

"Quick, get up, three bears have arrived!"

At the time Peter, Eugene and I were fast asleep in our bags. Awakened by Ernst's shout we dressed quickly—quicker than any soldier wakened by the sergeant-major in tsarist barracks! Meanwhile, Ernst had already dashed out with his rifle. Seizing my rifle, I rushed out after him, and saw the bears at Ernst's first shot gallop off like a spirited three-in-hand, scattering showers of water. Small hope we had of catching them! . . .

Apparently a she-bear and two cubs had decided to pay us a visit. The four of us set off in an attempt to catch up with them. I unleashed Merry, who rushed after the bears like an express train and when he caught up with the shaggy visitors frisked around them yapping wildly. However, by the time we appeared on the scene, the bears had made themselves scarce.

On the way back Ernst slipped and fell, filling his thigh boots with water. It was hardly a welcome incident, but Ernst was so excited over the bears' visitation that he seemed quite oblivious to the discomfort of water squelching between his toes with every step he took.

"We've lost the knack of hunting," I remarked when we were back home again, breaking the general silence caused by our failure.

"Yes," chimed in Peter; "A nice bear steak, this minute, wouldn't come amiss at all. . . . I remember we were once given bear-meat on the *Krassin* voyage. It had a pleasant enough taste but was over-salted."

"The ship's cooks don't know how to cook it properly," declared Eugene.

"Now our Dmitrich, here, would have made a first-rate dish of it," remarked Peter.

"If it hadn't been for Ernst's making a mess of thing with his shouts and letting off his rifle the she-bear and her two cubs would have been lying in front of our tent by now," I observed.

Krenkel took no offence at my remark, but instead propounded a "theoretical basis" for his unsuccessful shot.

"We are living here not for the sake of hunting, but for the advancement of science," he said. "You, Peter, ought to be interested in the fact of the bears' visit rather than in fresh bear-steaks. The fact in itself is a unique scientific discovery. . . . And so, long live science and down with hunting!" With which concluding remark Ernst wound up his short address.

We all burst out laughing; I was glad that Ernst with his bantering tone had put a stop to the arguments about unsuccessful hunting. Once more the talk turned to the conclusions we shall have to draw from our encounters with various animals and birds in the Central Polar Basin.

Yes, friend Nansen, we all respect you for your courage, knowledge and great wisdom, but with regard to your scientific conclusions we shall have to make some changes.

To-day's visit from the bears has finally convinced us that Fridtjof Nansen is wrong in his opinion that there is no life in the high latitudes of the Central Polar Basin. During the period of our drift from the North Pole (two months and ten days) we have seen five fulmars (of the gull family), two guillemots, and to-day one she-bear and two cubs. This is very significant, for we have not the slightest doubt that the she-bear whelped her cubs here, on the drifting ice. Bears must eat; marine animals are their food. Which means there must be seals here!

The existence of life in the heart of the Central Polar Basin may now be regarded as an indisputable fact.

We were awake all night discussing the subject, and hardly noticed when the time arrived for us to send the routine weather report to Rudolf Island. It was nearly 6 a.m. when Eugene went off to carry out the observations. Then Ernst tapped out the weather report, as well as a short radiogram informing *Pravda* of our nocturnal visitors.

Peter and I crawled into our sleeping-bags, and tried unsuccessfully to get off to sleep again, so I got up and cooked breakfast. I treated the lads to an omelette of fresh eggs which we all ate with tremendous relish.

August has set in with a gale. Again the weather is appalling; heavy wind, sometimes the squalls reach a velocity of 12 metres a second; on these occasions even our windmill folds up. The rain, which is mixed with snow, penetrates into every tiny nook and cranny. The wind has torn the tent in which Eugene carries out gravitational observations, so he has had to bring all his instruments into the living-tent until the gale abates.

He and Peter occupied themselves drafting a radiogram on the results of our scientific observations. In the space of 1,000 words they gave an account of their observations on meteorology, astronomy, magnetism, gravitation, hydro-biology and hydrology (especially the drift).

I examined the meat dump. I hacked through the ice with an axe and got out a lump of meat from the "refrigerator"—a hind leg. I discovered it was already going bad, and had to cut away all the rotten flesh; the result of this operation reduced the leg to half its original size. But the meat still smelled bad; true, it was not quite as high as when I first got it out, but quite high enough. It cannot be helped, we must use it as it is; we all have a craving for fresh meat. I appealed to our "sanitary inspector," Peter; he has a keen nose. He examined the meat from every angle, wrinkled up his nose a bit, but finally came to the conclusion that it was edible. After his verdict I cut up the meat then minced it in order to make rissoles. I seasoned it with plenty of onion, garlic and pepper, to disguise the smell.

This evening I lowered a current-meter to a depth of 400 metres, in order to study the drift. To-day has been an exceptional day: we are drifting at a great speed, alternately north and north-east. The speed of the drift is 21 kilometres per 24 hours. Since the day of our

landing at the Pole we have not drifted as quickly as this. If the sun is out to-morrow Eugene will take our bearings, and then we shall know exactly where we are.

It is now 1 a.m.; Ernst is busy transmitting a long radiogram to Rudolf Island. Peter is busy reading a current-meter.

We have received greetings from Moscow, from the members of the International Geological Congress.

August 2. A large number of radiograms await us on Dickson Island, but short-wave communications between Dickson and Rudolf have deteriorated, and the radiograms are held up. What a pity!

After dinner we assembled in the tent and after a general lighting of cigarettes Ernst tuned in to the Comintern Radio Station. Reception was particularly good on the long-wave band. We all put on our ear-phones and heard the broadcast of the evening edition of "Latest Radio News" direct from Moscow.

We were particularly delighted with the verses written by two young pioneers and broadcast in the children's programme. In these verses the youngsters express regret that their youth prevents them from "seeking out" the earth's axis; the children are eager to explore the "blank spots," but they are willing to wait a little, till they grow up. The verses end with the words: "We don't mind waiting, but please leave just one little blank spot for Sergei and me."

We fear that soon there will be no more "blank spots" left. Therefore we would advise Sergei and his chum to study hard, with a view to filling the post of superintendent of airport "North Pole." . . .

To-day we determined our new position. We have returned to the 88th parallel. In the last two days we have been carried back 11 miles to the north in a wavy line and 8 miles along a straight line. Our last recorded position was 87°53′ N. Lat. and 7° W. Long.; now we are back at 88°01′ N. Lat., and 3° W. Long. It is just as well that our drift southwards is being somewhat retarded. The farther our floe moves south, the greater will be the clearings encountered in the ice, and the greater the danger to our camp. Undoubtedly, if during these two days the wind had been blowing from the north, we should have been carried many more than 8 miles southwards, along a straight line.

Merry has slipped his leash. He is a remarkably crafty dog. As soon as one starts putting on his collar he "blows himself out," so much that one's finger can hardly pass under the collar, but a little later one finds that Merry had plenty of room to slip his head through it!

Eugene shifted the gravitational observatory to a new site and set up the instruments. With the help of the winch Peter lowered the plankton net to various depths, fishing for microscopic "inhabitants" of the Arctic Ocean. Afterwards he spent a long time examining his catch under the microscope.

I crawled into my sleeping-bag but could not drop off; I was feeling sick; I think the sausages must be the cause of it and cannot bear to look at one now. Peter is the same; but Eugene and Ernst are only too pleased to finish our portions of sausage, and declare them to be good.

Until dinner-time to-day the weather was very fine and calm, and the sun was shining; we took several photographs. Later we went out again to take some more photographs, but quite suddenly a fog crept up and hid the sun, so our plans were frustrated.

I sat down at my diary.

August 3. It was a hellish night for me: I had the most grinding headache, and was forced to take some pyramidon powders. I fell asleep at 4 a.m. and then not for long.

The weather has turned clear and sunny. Eugene has gone off for twenty-four hours—to carry out observations of magnetic variations. Peter managed to extract the current-meter early, before morning tea. He and I decided to go on an expedition, to make a thorough examination of our fissure; to cover a large area by canoe and photograph anything of interest with our cine-camera. Ernst loaded up the cine-camera, Peter and I put on the harness and hauled out the sledge with the canoe strapped on it. Ernst took a couple of photographs of us; the shots should turn out well.

As we neared the fissure I saw an enormous head protruding from the water. It was a sea-hare, weighing about twelve poods. We are all delighted—this is one more proof that life does exist in the Central Polar Basin!

Thus the old theories that the central part of the Polar Basin is extremely poor in vegetable and animal life are definitely disproved.

We have ascertained that the presence of seaweed lends a red and yellow tinge to the ice; we caught a small medusa; we have already mentioned the appearance of gulls and guillemots. When the bears turned up we had to ask ourselves what they fed on. Now this latest encounter with the sea-hare has confirmed our belief in a vegetable and animal kingdom in the Central Polar Basin.

We lowered the canoe into the water, Peter and I climbed in and paddled off, the sea-hare alternately surfacing and disappearing. We did our best to conceal ourselves; we tried to take it by surprise in order to shoot it, but were unsuccessful!

The fissure along which we paddled was as big as a river: at its narrowest part it was 30 metres wide, and at its widest 70 metres. On the banks of this "river" immense floes were piled up. The sea-hare appeared several times in various places, but always at a safe distance. We took a great many photographs.

On our return journey we saw an overturned icefloe partly covered with seaweed. We stopped the canoe and examined it closely. Using his knife, Peter carefully scraped off some of the seaweed into oiled paper; he is going to examine this polar vegetation under the microscope.

After this, satisfied with our spoils, we returned to the icefloe. Although we did not succeed in shooting the sea-hare, Peter has been able to enrich his hydro-biological "museum."

We left the sledge loaded with the canoe a hundred metres from the fissure. To-morrow we'll set off again, to shoot our "hare."

After dinner we listened with great enjoyment to "Latest Radio News" and to a broadcast for the Red Army.

I am just completing my diary entries now, then I shall dive deep into my sleeping-bag, and finish reading Chernyshevsky's "What to do?"

Thank goodness the temperature has dropped to 2° of frost; there will be less thawing now. We are heartily sick of the water, although we know that when the frosts set in we shall miss it; melting snow for our cooking and dish-washing will make a lot of extra work.

Peter returned at about 1 a.m. He has again lowered a current-meter to take a reading of the drift.

August 4. To-day I went off to get on the sea-hare's track. Several times I fell among the pack ice, but did not turn back. The hare refused to show himself. One more unsuccessful hunting expedition—the sea-hare must sense that he is being hunted, and has hidden himself somewhere.

Ernst shifted the tent containing the technical equipment to another spot. We started transferring the equipment packed away in the general stores tent. In this way we change the lay-out of our "polar town" nearly every day, in a constant endeavour to find the driest spot; as for the winds, it's impossible to protect oneself against them.

Eugene fell asleep immediately after dinner; he has worked thirty-five hours at a stretch. In the morning he took another astronomical reading: again we have been carried 4 miles northwards.

August 5. This morning I rose and dressed very quickly, as I had been sleeping in the bag without underwear, and it's rather cold in the tent.

I had a great disappointment to-day. Examining the "refrigerator," I dug open the cave in which I stored the meat and fish. I had hardly opened it up before a stench of rotting meat rushed out at me . . . I felt terribly discouraged—bang went all our hopes for supplies of fresh meat. The sun's rays penetrating through the mass of ice, had reached our food supplies and ruined them. The fish, which lay deep down in the cave, was soft, but did not smell tainted. I took the meat out, scraped it with my knife, and the smell lessened considerably. As a last hope I rammed the meat with pieces of ice. Perhaps some of it is still edible.

This discovery made me worry about the state of 100 kilograms of veal buried in a neighbouring "refrigerator." I hurried off to examine it. I was a considerable time working with the ice-pick. When I got the meat out it was better than I had hoped; after a good scraping it will still be edible. Of course, if it had been lying on a butcher's slab any sanitary inspector would have promptly prosecuted the manager and condemned the veal, but in our circumstances it will have to pass. Our sanitary inspector is "one of us"—he'll give his consent, and if he won't, we'll have to use our powers of persuasion.

Although our stomachs don't react too happily to tainted food, it cannot be helped; meat is an important anti-scurvy food. As for the smell—we have reliable and well-tried spices for dealing with that: bay leaves, onions, garlic and pepper, in quantities that make one's throat as rough as sandpaper. . . . This is my own invention and has

been approved by every inhabitant of North Pole Station, even Merry who, strange as it may seem, cleans up the plates of highly seasoned food with great relish. . . .

For dinner to-day we had fish-soup, fried fish, and tea. There is quite a lot of fish-soup left over for to-morrow, as I cooked enough for the two days, about half a bucketful.

Our tent is getting very damp, and Ernst suggested that we light a primus-stove for about an hour. That did the trick ; it got much warmer and cosier ; we even stretched out on the skins and enjoyed a read during our short break.

Peter has been working at the winch all day, establishing a complete hydrological station at a depth of 1,000 metres. He also lowered the current-meter four times.

I told Peter that I had again seen the icefloe that was covered with seaweed. He at once set off on skis to collect some of the seaweed and is now carefully examining it in his laboratory.

August 6. Up till dinner-time I was busy making parts out of tin for a new apparatus which Eugene wanted to use to record the direction of the wind.

A north-westerly wind is driving our floe to the south-east. The current-meter, lowered into the depths of the ocean, records the miles just like milestones . . . We definitely do not like this impetuous movement to the south ; the ice will not receive a friendly welcome there.

With the onset of the frosts it becomes increasingly difficult for Peter to continue with his work. All day long he has to heat water to pour over the freezing mechanisms of the current-meters.

Ernst, Eugene and I put the windmill in order. Now it charges up the accumulators smoothly and well ; the wind is getting stronger, much to Ernst's delight.

At dinner-time we each had 40 grammes of vodka. Peter had saved this for us, when distilling the brandy into alcohol. What a pity that the alcohol for our station was left behind on Rudolf Island ; now, when Peter wants some alcohol for scientific purposes he has to distil it from the brandy.

We heard a good speech on the radio on the preparations being made for the elections to the Supreme Soviet of the U.S.S.R. Only Peter missed hearing it ; he was working with the current-meter at the time, making observations of the curious drift. To-night, when we turn in, I must remember to tell him all about it.

It is really heartening to see how well Eugene and Peter do their work. They take no account of difficulties or time, trying to put in as much work as possible, checking every scientific observation three times. Altogether they apply themselves to their job most sedulously.

For us time flies so quickly that we never notice how the days slip by. We even regret the shortness of the days. In this respect, however, we are helpless : You can't get an extra minute over and above the twenty-four hours !

August 7. Again I have had a rotten night; a bad headache and no sleep.

Eugene got busy working up the data of his astronomical observations, while Peter took current-meter readings. Meanwhile I stuck patches of percale on our general storage tent, which had been badly ripped by the wind. When I had finished this job I went off to the fissure; once again I stood there for a long time, waiting and hoping that the sea-hare would appear, but his cunning is greater than mine. . . .

Later I searched among the stores to find some stuff suitable for wicks, for I shall soon start fixing up the oil stoves, and our equipment does not include broad wicks. Eventually I chose for the purpose a woollen sock, cut into strips. A wick made of pure wool burns very well; puttee cloth is not so good—too much cotton in it. I told the lads of my invention; all our old wollen socks will serve for wicks.

It is now midnight. Peter is still at work with the current-meter; a strong drift has set in, and he wants to check up on the speed. Each hour brings us nearer to our beloved Motherland, though we have still many thousands of kilometres of unexplored wastes ahead of us before we reach Moscow, and the very method of our progress is hardly a tried one, following a definite pattern. The going is good here: the ice does not worry us and there is no strong wind to break up our floe. The nearer we get to our beloved Motherland the better we shall be pleased, though doubtless in those regions, there will be quite enough hardships awaiting us: the farther south we drift the less dense the ice. Possibly our floe senses this, and is strongly resisting by suddenly changing over from a southerly course to a north-easterly or north-westerly one.

August 8. I am making a little tin tank to convert two lamps into a big one. Previously, the oil in a lamp would only last six hours, now with this tank there should be sufficient for the whole twenty-four hours. The tent is most awkward to work in: no table, no bench, I have to do everything on my knees, which are now being used as a vice; I grip the piece of tin between my legs and cut it with a handsaw.

There were only two of us for tea, Eugene and myself. Ernst was asleep after the night watch. Peter was engaged on his usual occupation of taking readings with the current-meter; he worked all day at the fissure, observing the currents which rise in the upper layers of the ocean and influence the drift of the ice; he did not get back till late this evening.

In the morning Eugene settled down to working up the data of his magnetic and astronomical observations. The astronomical determinations form the basis of our study of the drift. In order to compile a detailed map of the drift we need as many of these observations as possible. This is why Eugene "catches the sun" whenever it breaks through the ever-present clouds. He is doing this now.

I am very depressed these days. I suppose it must be the result of my poor state of health: I suffer from nausea, my mouth is always watering; in the morning my head feels as heavy as lead. I try to hide my condition, but the lads have noticed it, as I am constantly swallowing

pyramidon powders. At times I feel so ill that I seriously think I must be in a bad way. . . . So what! Even if this should be the case, our labours have not been wasted; whatever may happen to me, I shall always be glad that our Motherland has carried out this expedition.

Yesterday we all sent articles to the newspapers: Ernst and I sent one to *Pravda*, Eugene to *Komsomolskaya Pravda*, Peter to *Leningradskaya Pravda*.

The weather gets worse and worse; the continuous dampness has taken all vitality out of us.

August 9. At 4.30 a.m. Ernst woke Peter to congratulate him: yesterday a daughter was born to Peter. We heard the news over the radio. Naturally Peter is feeling anxious about his wife's state of health.

An hour later more news came over: the daughter is a fine baby, weighing 10 pounds, and Peter's wife is feeling fine. Peter's joy is written all over his face.

I went on with my work after tea: bending, soldering and drilling an aluminium tube. However, I had to break off as the lads wanted their dinner. I went to the kitchen, warmed up what was left of the fish soup, adding a pinch of salt and water to thin it a bit. Then I cooked some peas for the main course to go with yesterday's meat rissoles. For our third course we had stewed dried fruit and tea.

Eugene carried out his routine astronomical determination; we have crossed the 88th parallel for the third time, this time once again travelling south. The speed of the drift has increased. When we transmitted our position to Rudolf Island they were amazed to learn of our swift progress southwards.

Peter is so busy working up the data of his current-meter readings that he has not had time even to write an article for *Izvestia* (he is the correspondent for that newspaper). The editors keep sending him one polite reminder after another.

I went off to the kitchen to solder the oil tank I am making for the lamps. I have finished it now, except for the legs.

In the evening we assembled in the tent, bringing our tea and cake with us. We congratulated Peter on the birth of his daughter: he sat there beaming.

August 10. In the morning, immediately after breakfast, we started establishing a complete hydrological station. Having repaired the small cable, Peter drew samples from the upper levels. Then he lowered four bathometers to a depth of 2,000 metres.

The wind is fiercer, its velocity reaching 16 metres a second, which has still further increased the speed of our drift. The current drove the cable with the bathometer under the ice so we had to interrupt the hydrological work and wait.

In the morning when Peter was fixing up a deep-water station, the blizzard and the wet snow damaged the brake. Then the strength of the drift pressed the cable against the lower edge of the hole. With the help of a block we released the cable, but could not pull it up. We shall have to wait till the drift slows down.

The four bathometers remain suspended deep under the ice. So far we have been unable to extricate them.

Eugene prepared his instruments for gravitational observations, but the wind has ripped the edges of his tent and, in order to save his instruments he had to fling himself flat on the tins and cases. Only after we had carefully covered the instruments with plywood boards and weighted them down did our anxiety cease.

Wet snow is falling; it beats against our eyes. Having no wish to get soaked we stay huddled up in our living-tent. Peter goes about morosely: for three days now it has been impossible to establish a hydrological station, though it is time a depth-sounding was taken, for we are now drifting rapidly. Eugene should be preparing for gravitational observations, but the gale thwarts all our plans.

Peter assures us that he "heard" the bathometer hit against the Greenwich meridian!

This morning I made fast the stakes in the kitchen tent to prevent the wind from carrying away our galley; then I cooked enough food for two days, as to-day and to-morrow we shall all be busy turning the winch.

The foreign primus stove, of Swedish make, got choked up; I tried clearing it with a primus needle; suddenly a stream of benzine filled the cup and the primus burst into flames. We had the tent laced up tightly, to prevent the gale from blowing snow into the soup and porridge. Before I got the tent unlaced, half of it was in flames—the top, too, was on fire. I wrapped my hands in rags, seized the blazing primus and flung it out of the tent into the snow. I got off lightly with only some burns on my hands, but it was very painful to wash them in water. Still, I managed to cook the dinner.

We all assembled in the kitchen for our dinner, and after the meal went off to the living-tent for a smoke. The floor of the living-tent is spread with fur skins; as Ernst says, we are quite snug in here; moreover, the temperature in the tent is 2 degrees above zero.

We are lying on the fur rugs, but the whole of our "palace" is shaking in the wind. Nevertheless, Eugene managed to complete his routine meteorological observations. In order to safeguard his instruments, he had to shut up his observatory for the day. He slackened the guy-ropes of the tents, and placed sledges on top of his "studies" to keep them from blowing away. After our smoke we left the tent, and sighted a black object in the distance, close to the fissure. Eugene thought it was a walrus, but when we got nearer it turned out to be the rubber boat which the wind had torn loose from the dump and overturned. We carried it back to the dump and jammed it among the pack ice.

In the evening I made tea. After tea Ernst lay down to sleep, while Peter and I got to work making guy-ropes for the living-tent. The wind is shaking our home to bits, and there's no sign of the cursed blizzard abating.

We put on our oilskins when we went out but the snow blew inside our collars, penetrating our shirts. We soon got soaked, and we have no place to dry our clothes. Drying our clothes is the worst "bottleneck"

of our expedition. When it rains or there is a fall of wet snow we try not to stay out long. We take care to change as soon as our clothes get wet, as we are afraid of catching cold.

In strong gales like this we have to be very much on the alert, so that trouble does not catch us unawares. Ernst is on camp-watch.

I am very worried: our dumps are being snowed under. As soon as the gale abates we must go and shovel away the snow, digging out all the gear which was brought here from the mainland.

Peter was feeling wakeful, so he got up and examined the data of his observations. Afterwards he put a permanganate compress on my hands, to ease the pain of the burns, and bound them up.

I sat down to write up my diary as best I could with bandaged hands.

August 11. We have had a night of alarm and tension. Although to a casual observer we all appeared to be sleeping, with just Ernst on watch, actually we all lay awake in our sleeping-bags, for our tent shook terribly, and the wind roared in the aerial.

We lay there thinking how nice it would be if no new fissures appeared on the icefloe, if the water didn't flood the dumps or our tents . . . However, our living-tent and the tent in which the radio is installed we should be able to save. The data from the scientific observations we should have to save at all costs.

Though I had staked it securely, the kitchen tent is leaning over on one side, i.e., one side is pressed down against the floe.

We had breakfast: lemon-tea and caviare. What a pity we have no fresh bread, and the rusks have run out. So that the boys should not miss the rusks, I mixed a canful of dough and made some flapjacks, enough to last two or three days. The baking of them took me till 2 p.m., then I prepared the dinner.

Say what you like, but to sit patiently before burning primus stoves for five hours at a stretch needs some previous training in hell. I sit on a barrel, with a primus roaring away at my feet, for hours. Only a housewife could appreciate what I feel like, and even she has never had to put up with such inconveniences as these.

We assembled in the kitchen tent for our dinner. Then I cleared away the dishes, laced up the tent, and we went off to our "palace" for a smoke.

Peter worked up the data of the current-meter readings. We continue to drift rapidly. It is still impossible to extract the bathometers which have jammed at a depth of 2,000 metres. This is causing Peter considerable anxiety and the rest of us also. The floe might even be carried across the 87th parallel, without our being able to fix up a hydrological station at the present latitude.

Such are the thoughts with which our minds are filled every hour we spend on the floe. No earlier expedition has ever been able to give an answer to the simplest question posed by science relating to the drift of the ice in the Central Polar Basin. All the efforts and energy of explorers have had to be spent in breaking through the pack-ice, in making a safe voyage. They could think of nothing else, but we have to.

Eugene spent all day working up his materials on magnetic variations. The sun twice broke through for a short time, anyhow, it has not completely forsaken us. Eugene managed to make an astronomical determination. It seems that our floe has travelled ten miles in twenty-four hours.

We are all keyed up, but nobody has any serious apprehension of disaster. What we fear most is any threat to our scientific work. We have just one ambition always in our minds and on our lips: to prevent any obstacle to our research work. We must stay on the floe till the spring—whatever the effort may cost us. But all are determined, no matter what happens, to hold out and make the greatest possible number of scientific observations.

I went to bed while Eugene was still working up his data. Peter, too, was working up the results of his observatons and afterwards wrote an article for *Izvestia*.

In this biting wind, to which is added wet snow, our dog Merry has lost all resemblance to his name. He has changed into a pitiable, miserable creature; he has curled himself up in a corner and doesn't even ask for food. We had to go out and move him to a more protected spot, behind the tent, where the wind is not so fierce. As soon as we shifted him to his new place he immediately came back to life and started romping, reminding us that he was still the same Merry.

Ernst woke up (he had been having a little sleep before his watch). When he saw we were not in the tent, he wanted to get out of his sleeping-bag, thinking that something must have happened to the floe. But on hearing our voices, he was reassured and stayed where he was. He says he cannot sleep for long as his nerves are on edge, listening all the time to the wind. I understand him well enough; all our nerves are on edge.

I am surprised at the way Ernst rests: he lies quite still with his eyes shut, as if he were asleep, but actually he hears everything.

During the evening I wrote an article for *Pravda* on the results of three months' work on the floe.

I had a radiogram to-day from my own Volodichka, telling me she is off on August 15 to Essentuki[1] for treatment. I am glad she will have a rest.

August 12. The Arctic now and then reminds us of its grimmer aspects, as though fearing lest we become snug and complacent. A high wind is blowing, with a velocity of 12 metres per second. Wet snow is falling, and the temperature is 1° below zero. This morning it was still impossible to pull up the bathometers, as they are still stuck to the edge of the hole. So as not to waste time, Peter is working up his data and writing an article about the drift.

Once more the sun broke through the clouds, and Eugene succeeded in drawing one astronomical line. But he still has to "catch" the sun a second time.

After breakfast Ernst turned into his bag to sleep. I spent the whole morning clearing the snow from the dumps, which are half buried under the drifts. The paraffin containers, too, have been completely snowed under.

[1] A famous spa in the Caucasus (Translator).

After midday Eugene again "caught" the sun; he charted a second line, and determined our position. It seems that in twenty-four hours we have travelled another 16 miles southwards and are now at N. Lat. 87°20'. This is the most rapid drift we have experienced since we have been on the floe.

"Soon we'll be travelling even faster," prophesies Peter.

Ernst has taken down a long radiogram; an announcement of a competition for Soviet radio amateurs; whoever is the first to set up contact with Krenkel will be presented with a radio receiver.

I cooked the dinner. We decided to rest after dinner. I particularly urged Ernst to get some sleep, as he has a lot of work ahead of him to-night. Rudolf Island has informed us that Levanevsky's four-engined plane has already taken off from Moscow for Alaska, and that we must keep in touch with it.

All night and on into the following day Ernst went without sleep listening for the radio on Levanevsky's plane. In the morning I brought him some tea, as he hardly leaves the instrument.

Our drift has slowed down a bit, and the cable can now be pulled up, so I woke Peter to come out with me to the winch. Poor Peter had only just lain down, and was very reluctant to get out of his sleeping-bag. He protested a little and then got up quickly and we both went off to the hole, to wind up the cable from the depths of the Arctic Ocean.

August 13. Though it was as late as 5 a.m. when I went to bed, it took me a long time to drop off. Only two hours later I crawled out of my bag. I asked the position of Levanevsky's plane. We are once more nursing a faint hope that this—the third—trans-polar flight may make a detour for us, and that Levanevsky will drop us some burners for the primus-stoves, which we have asked for, also letters and newspapers.

Peter is continuing his work on the setting up of a complete hydrological station. I made tea and offered a cup to Ernst but he refused it, so I made him some coffee instead and took it into his radio hut.

After breakfast Eugene pitched the tent in preparation for gravitational observations. I mended the primus and then cooked the dinner.

Almost every five minutes I was running out to the radio hut to ask Ernst for news of Levanevsky. Ernst's invariable reply was that the plane was flying in difficult conditions, against strong head-winds with a velocity reaching 100 kilometres an hour. . . .

"The plane's cabin windows are covered with frost," states Krenkel and rapidly enters this report in the radio-log.

Later we learn that the plane is flying over the North Pole.

"We had difficulty in making it," reported Levanevsky.

We know what a devilish journey it is, particularly if there is cloud and head-winds to contend with!

Soon after this came the report that the plane's starboard engine had failed.

"Flying on three engines, very difficult, flying in thick cloud. . . ."

This report ran through us all like an electric current. We realised

that the situation was very serious. If such an intrepid and sensible chap as Levanevsky could send out such a message, it meant that the crew was really up against it. We all felt completely stunned.

I made some coffee for Ernst, to keep him awake, for this is the second day and night that Krenkel has been glued to the radio without once removing his earphones.

In the meantime Eugene had pitched his tent and set up all his gravitational instruments. To-morrow morning he starts on a 24-hour series of observations. Peter came in after lowering four bathometers to a depth of 4,000 metres.

"We'll have a little rest, then we'll start hauling up the bathometers," he said at dinner-time.

After dinner we were all anxious, and sat in the tent smoking in silence. After a while I got up and said:

"Come on, Peter, let's have a go at the 'wrench.'"

The "wrench" is our nickname for the hydrological winch, with which we raise the bathometers.

It was nearly evening, but no more reports had been received from Levanevsky. This prolonged silence caused us a great deal of anxiety, but we went on with our work. We imagine that he must have continued his flight on three engines, and that his radio set may have "gone dead," as happened to Vodopyanov's plane when we landed at the North Pole.

Ernst continues to sit at the radio receiver, listening with extreme concentration.

Peter and I went out to haul up the bathometers. Eugene came to our help, as it is very difficult for the two of us to turn the winch without a relief.

After this I brought in a tin of food and a case of butter from the dump, and we three had a bite to eat; Ernst refused to remove his earphones, so was unable to join us.

Every five or six hours I brewed some coffee for Ernst. He looked very tired—seemed on the verge of collapse.

Naturally, in our present state of worry and dejection, none of us feel like sleeping. I thought of finishing the article for *Pravda* which I began yesterday, but found I could not get on with it. I got into my sleeping-bag, but was out of it and on my feet again within half an hour.

Moscow has notified us that they are keeping a look-out, listening for the radio on Levanevsky's plane. Ernst was asked to keep a look-out on the emergency wave-length: perhaps the plane has made a landing on the ice and is now using the emergency radio set.

I went back into the tent, but found I could neither sleep nor relax, so I got up again and returned to the radio tent.

Eugene and Peter also took a long time getting off to sleep.

August 14. During the night we slept very little and as if by arrangement we all made straight for the radio tent. Ernst continues to sit at the radio desk with his earphones on, listening for any signals from Levanevsky's plane.

At 7 a.m. we listened to "Latest Radio News." We learned that

nothing had been heard from Levanevsky. Our hearts sank; we were filled with anxiety. How will they find him? But we refuse to give up hope.

We have asked the radio operators on Rudolf Island to give us a chance of getting Ernst off to bed, even if only for two or three hours. His face is pale and he is completely exhausted for lack of sleep. Our comrades on Rudolf Island agreed. They will keep a careful look-out and won't call us until the hour we fix upon.

Eugene carried out an astronomical determination, but as he has no time to make the necessary computations, we are using the old co-ordinates. Taking advantage of the fine weather he is making gravitational observations and has not left the instruments all day.

Peter is lengthening the cable and repairing the weak places in it. He is spending the whole evening on this job.

We are all trying to work harder than ever now. But whenever we have a moment's rest, the conversation turns on Levanevsky, and we begin to worry (on an icefloe this is not the most desirable state of affairs). It would be better if we didn't have a single free moment, for while the lads are working they are not depressed.

I unpacked the general storehouse. Before the blizzard set in we covered it with percale, but despite our precautions a great deal of snow has seeped into our hooded deerskin coats, knapsacks and fur clothes. I beat them all out and spread them on the snow—displaying them as in a shop window—they will dry in the sun which has just come out.

After this I cooked the dinner and brewed some more coffee for Ernst. He says it helps to keep him awake.

Through constantly working the winch Peter's arms are swollen. Frankly, we never thought the winch would wear us out like this.

"The hydrologists can have no idea," says Peter, "of the labour we expend on obtaining each sample of water or in taking a depth-sounding."

"Of course, everything has to be done by hand," I said, "but what is most trying is that sometimes the water samples have to be taken twice, to make sure of the results of the examination. . . ."

"When I get back to Moscow I shall probably always walk about bent double," Shirshov joked, "what with stooping over the winch and paying out and hauling in the cable."

Ernst demurred.

"Before we get back to the mainland," he said, "our spines will completely straighten out; we'll even have forgotten that the days were so arduous."

"That's something you'll never forget," retorted Shirshov.

He fell silent, and then for some reason remarked:

"It's a pity we didn't bring a football with us. We might have been able to snatch an odd moment for some sport."

Eugene laughed.

"I can just see Dmitrich as our goalkeeper! We should have had to order special fur shorts; to make up a team we should have had to invite the she-bear and her cubs."

We had to cut short our sportive talk, for Ernst had tuned in to Moscow.

"Latest Radio News" has just announced that Heroes of the Soviet Union Vodopyanov, Molokov and Alexeyev, who participated in the air expedition to the North Pole, are taking-off to search for Lavenevsky's plane.

Fog is creeping up. Evidently, it is going to snow.

August 15. We are very keyed up. Ernst spends all day and night sitting at the radio listening in case the "voice" of Levanevsky's plane flashes through the air. At the same time, however, we have not interrupted our scientific observations; which is the main purpose for our being on the icefloe.

On August 14 our position was 87°14′ N. Lat., 0° W Long.; to-day it is 87°10′ N. Lat., 0°03′ W. Long. Thus, even in windless weather we have covered about four miles in one day. It has been definitely established (I think this is a great contribution to science) that the drift is not caused by the wind alone.

Taking my skis and field-glasses, I set off for the fissure, to examine the state of the clipper-boat. Our lakes are covered with a thin crust of ice.

When I returned to camp I helped Peter draw up the current-meter. He has been occupied in current-meter observations since morning, having carried out two series of them. We lowered the lead to the bottom, then I went off to cook the dinner. Strictly speaking my turn of kitchen duty has ended and Ernst should take over but I still continue to cook the dinners, as Ernst's time is wholly taken up at the radio station.

Peter came in and announced:

"The depth here is great, 4,354 metres."

Ernst has taken a radiogram addressed to me: Moscow is inquiring as to the state of our airfield. We went off on skis to survey all the best parts of the floe, and travelled several kilometers in various directions. The results are far from encouraging: innumerable hummocks, much pack-ice and lakes.

Late in the evening we sent this answer: "The surface of the old airfield is damaged. But in five days we can have ready in different places two aerodromes, 500 and 700 metres long respectively. As the lakes freeze over, the dimensions of the aerodromes will become greater. The ice is strong; we recommend landing on wheels. Please bring ten bottles of normal water for analyses; 500 grammes of chemically pure hyposulphite, oil stoves with wick burners, three powerful oil lamps, fruit, vegetables and Shokalsky's 'Oceanography.'"

Afterwards we went out to the hydrological winch to draw up the lead from the sea bottom. We worked without a break till 1 a.m. By then we were starving, so I got tea ready and the four of us assembled in the living-tent.

It is very exhausting to work the winch for three hours without a break, but we are used to it; the work is the main thing. We are here to enrich science by new observations, so we can't take account of hardships.

It was 2 a.m. when we finally turned in. Ernst has to go on listening for the plane till morning.

My heart aches when I look at Ernst. He helped us turn the winch. Later, at tea all he ate was a small piece of sausage. The extreme fatigue, the continuous abstention from food (all these days he has had nothing but coffee) has brought on nausea. But instead of knocking-off he went back again to the radio desk, put on his earphones and resumed his listening for Levanevsky's plane.

After tea Peter continued with his current-meter readings, and worked all night till 8 a.m. He too, is very tired, almost worn out. He was hardly able to drag himself back to the tent; he climbed into his sleeping-bag, and before I could look round he was asleep.

There is so much for us to do here, so very much.

August 16. We have received detailed information from the Government Commission on the measures which are being taken to search for Levanevsky's plane: they propose to turn our floe into an air base.

My heart aches to think of our Soviet airmen who are, perhaps, in terrible distress.

At long last, after transmitting the weather report, Ernst decided to turn in and get some sleep. I got up, and taking the sledge and rifle, went off to bring back the rubber boat. The possibility of a sudden jamming of the ice cannot be excluded, and we might find ourselves left without it. . . . I gingerly made my way over the floating ice and channels of open water: I had to carry the sledge; I could not paddle across the fissures in a canoe though they were 50 to 60 metres wide because they were covered with a thin crust of ice.

I reached the spot where the boat had been left, pulled it out, heaved it on the sledge, and then photographed it; after this I hauled it back to the camp. Now that our boat is safe my mind is at rest.

Back in camp I cooked the dinner: first course—pea soup; second course—buckwheat porridge, and third course—stewed dried fruit and tea. We had a good meal.

Eugene was occupied in gravitational observations from morning till evening.

Until dinner-time Peter carried out observations with two current-meters, taking readings of the currents and the drift. Yesterday it seemed to him that the second current-meter which he had lowered to a depth of 400 metres was not working properly, and he checked it several times. To-day he has established the precise cause for its "capricious" behaviour.

Here is a most interesting phenomenon which no one had ever observed before. Apparently the rapid drift of the ice causes a reverse current, which Shirshov discovered at a depth of 50–75 metres. If such a miracle were possible, and our floe were to descend 50 metres into the depths of the ocean (and I can just imagine how well we would feel down there), we should reverse our course and travel backwards, soon finding ourselves once more at the North Pole. . . .

Dinner over, we went into the tent for a smoke and a rest: Afterwards

Peter resumed work with the current-meters, studying the currents, while I collected an icepick, spade, axe, rifle, and camera and went off on my skis to make an airfield.

We must now be prepared to receive heavy planes on our floe. It is difficult and arduous work, clearing an airfield of pack-ice, hummocks and other obstacles. Four hours' work made me very tired, for it is awkward single-handed to cut the ice with an icepick, load it on to the sledge and then cart it away. As I worked I bent down many times to the cold pools to drink the water as I used to do when out shooting on hot days.

I got so warm that I took off my fur waistcoat and felt jerkin, but the sweat continued to stream off me.

I returned to the camp and got the tea ready. It was already midnight. I decided to turn in a bit earlier, with the intention of getting up in a few hours and resuming work on the airfield.

August 17. I never got off to sleep after all. When the fine weather sets in living becomes a pleasure, but when the wind drops Ernst begins to worry; he looks anxiously at the accumulators, sighs, and cuts down every possible word in his radio transmissions. For this reason during the night we decided to charge up the accumulators. Ernst and I worked all night.

After a short rest the following morning, I went off at midday to work on the airfield. Peter was still asleep when I left: he had been working with the current-meters till morning. We woke him at 2 p.m. He got up at once and went off to continue his observations with the current-meter.

As soon as I arrived at the airfield the weather began to change for the worse; a strong wind sprang up and it grew dark and foggy. The sun which had warmed and cheered us for three days disappeared. Ernst hurried off to start up the windmill.

I returned to camp at 3 p.m. and cooked dinner. After dinner I washed all the dishes.

Ernst has put on his earphones—he continues to listen-in on the wave-length of the radio in Levanevsky's plane.

Peter has gone off to work at the hole in the ice.

Eugene is carrying out a 24-hour series of observations of magnetic variations, and will be engaged on this continually till midday of August 18.

I tidied up our medical outfit. I fixed up a special box for it—one which had formerly been used for sweets. Our first-aid kit will now hang in the tent, and Peter can transfer his hydro-chemical laboratory to the space thus cleared on the table, on the shelves and under the table, for in his tent everything freezes up.

This evening I made some flapjacks for tea. Then I made entries in my diary. Twice I tried to tune in to Moscow, without success. It is so disappointing, when reception is poor. We long to know what is happening; here we sit, with our ear-phones on, straining to hear every word coming over the air.

The drift is carrying us rapidly westwards. Heavy packing of the ice has begun. Large masses of ice are piled up near the fissure. From a distance it looks as though some one were building three-storied ice houses. I wanted to photograph these glittering structures, but poor visibility prevented me.

August 18. A strong wind sprang up during the night, accompanied by a heavy snowfall. I was unable to get a moment's sleep through the night. Eugene was carrying out a series of magnetic observations. Ernst was on watch. The only one who slept till morning was Peter.

Ernst now and then went outside to hammer down the pegs of the tent. The jamming of the ice was not very great though from the force of the wind we thought that danger might overtake us at any minute.

Towards morning I dropped off for a spell, but soon woke up again and made some cocoa.

The weather gets worse and worse. Rain is falling; it instantly turns to ice. It is impossible to walk any distance. All our tents and dumps are covered with a thick layer of transparent ice, and a similar layer of ice covers all our clothes and oilskins. When we do go out the icicles drop from us.

Peter is continually making observations with the current-meter. The work is so interesting and important, that he devotes a great deal of time to it. The discovery of a reverse current at various depths, is a great contribution to hydrological science and heedless of our original programme we are trying to carry out every test this discovery may demand.

All the secrets and mysteries of the Central Polar Basin must be revealed. Peter and Eugene in the course of their work, discover facts and phenomena hitherto unknown to the scientific world. All these new phenomena they are doing their utmost to investigate thoroughly, regardless of time and labour.

I made a wooden flooring for the tent. Although the snow is still falling, I had to bring in the boards from our dumps, and at every step sank knee deep in the water.

We listened-in to "Latest Radio News," and learned of the fine way in which Aviation Day was celebrated to-day throughout the country. Our airmen gave a brilliant demonstration of their flying skill at Tushino aerodrome. The news drove all our drowsiness away, so we resumed our work; we shovelled snow high up around our tent, and laid the wooden flooring.

Peter is shifting some of his scientific equipment into the living-tent. We are letting him have our only table. As for us, our writing will have to be done on a piece of plywood laid across our knees.

"It's all very well for those with fat legs!" joked Ernst winking at me slyly.

It is surprising what one can get used to, living on an icefloe. We are certainly acquiring great experience here.

August 19. It rained very heavily all night, and once again we had no sleep.

Ernst and I made omelettes for breakfast. After breakfast we busied ourselves cleaning out the primus burners; Ernst is quite an expert at the job. We lit our big lamp, heated the burners thoroughly, and cleaned them in no time with some steel wire.

After this Ernst transmitted to Rudolf Island the weather report which Eugene had prepared.

I took my skis and made a round of the dumps, opening up every snow pit, and with great difficulty, wrenching free the rubber paraffin containers which, through the action of the sun's rays, had become frozen into the ice. When I finished my work at the dumps and had put all our gear in order, I went back to camp and cooked the dinner.

After dinner Ernst and I had a smoke and before turning in I fed Merry.

We listened to "Latest Radio News" broadcast to the Arctic, lying stretched out on the fur skins spread on the floor of our tent, just as though we were on the beach, although the available living space somewhat cramped our movements. We all listened intently with the earphones glued to our ears, so as not to miss a word. We were very excited, for we had not listened to Moscow for a long time.

At our request announcer Golovina (whose voice we particularly like) read a review of international affairs. We were delighted to hear what a mauling the rebels have received from the gallant Republican forces in Spain.

Despite the rain, Peter has been taking readings with the current-meter, observing the drift. He is pleased there is no frost as this obviates the need to heat water for the meters.

All day long Eugene has been working up the data of his gravitational observations, for he has accumulated a large number of records. He has folded up his portable tent-laboratory, as he feared the wind would tear it to pieces. Every time there is a gale he has to put "Emalite" patches on one or other of his tents. He is fed up with doing this, for soon there will be nothing left to patch: the whole tent will be in shreds.

Silk tents have proved to be too frail. Although the fabric has been rubberised, it is not durable. Linen is the best stuff for tents.

In future, silk tents ought not be taken on expeditions such as ours. What attracted me was their lightness and compactness. Now I am convinced that silk is unpractical and too flimsy a material.

The day after to-morrow we shall have completed three months' stay on the floe. I checked up to see if we had managed to save any of the food or fuel. A case of food which we reckoned would last us ten days was sufficient for fifteen. This represented a great saving. There were still forty cases of food left; enough for more than a year on the floe. As for fuel we had enough to last us two years. There was still much fur clothing left. We had been changing our socks and underwear every other month; now we can change every month.

What a pity it is we have no bath-house. But for the present we have to manage in primitive fashion: once a month we wash one another's heads and necks. Only our chum Merry frequently scampers off to the

lakes formed on the ice, and attempts to get a swim. We keep a very strict watch on him.

August 20. A vile day: fog and snow.

Ernst, as usual, turned into his bag after breakfast: he had been on watch all night.

Eugene is busy working up materials on magnetic variations.

Peter has gone off to the current-meters to continue his study of the currents.

I was left alone in the camp and tidied up the kitchen.

Afterwards I went out to check up on the behaviour of the fissure, which is causing me increasing anxiety. Taking rifle and field-glasses with me I went off on skis and spent a long time examinng the floe. So far no complications need be feared. True I couldn't go far on account of the thick fog, visibility is barely 50 metres. From a short distance away the camp is completely hidden from view.

On my return journey I met Eugene also on skis, on his way to examine the fissure, so he said. But personally I think he was simply out for an airing.

"I decided to stretch my legs, and have a look at the floe," he said.

"Let's go together," I suggested.

So we set off to examine the fissure farther on; a trip of this kind is more cheerful and less dangerous if there are two of you. We went in a southerly direction. The whole of this part of the floe is covered with huge blocks of ice. I could hardly make out the ski tracks I had made when I was here ten days ago. Everything is snowed under. Eugene and I went about a kilometre down the length of the fissure. Strictly speaking, nothing was left of the fissure; a huge bank of ice has been thrown up along the edges of the floe, and beyond was the sea. Eugene stared hard, and then remarked:

"Look, I can see something floating over there. Seems to me like seaweed. We must get hold of some for Peter to examine under the microscope."

And Eugene clambered along the ice bank, dragged some of the seaweed out of the water, then carefully wrapped it up in oiled paper.

When we got back to camp we handed over our find to Peter. He sat down without delay and placed some of it under his microscope. After careful examination he looked up and said:

"A most interesting find. I must go and see for myself."

Straightway Peter strapped on his skis and went off to the spot which we had visited in the morning. He returned with great booty: he had collected in a jar all the seaweed floating in that region. He made a long and careful microscopic examination of it in the laboratory.

After I had done some more work on the airfield I decided to make some flapjacks for the lads, as we had not had any for a long time. I mixed a big saucepanful of dough, but something went wrong with it. Housewives would probably laugh at me. Instead of adding water to the flour, I did just the opposite: I half-filled a saucepan with water and then proceeded to add flour! There was I, merrily adding flour, and

yet more flour, but still the dough was too wet: I was making flapjacks till midnight. Then I brewed some coffee, which Ernst is very fond of. Without waiting for the other two lads to come in Ernst and I had a good "tuck-in."

By the way, mixing the dough for flapjacks is an excellent way of cleaning your hands!

Eugene and Peter ought to be back soon; I made cocoa for them. In an hour's time the three of us should be on our way to the airfield to clear away the ice-blocks. Ernst alone will be left in the camp, at his radio receiver.

We are now carrying out only the most necessary scientific observations, and keeping radio watch. The rest of the time we work persistently at clearing the airfield, in the hope that Vodopyanov, Molokov and Alexeyev will use it as a landing ground for their heavy planes when searching for Levanevsky.

The weather is vile—snow and fog. We are working without our fur jackets, using spades and pick-axes for tools We're wet through, but go on working.

Working under these conditions is a great strain. Moreover we have to fling the spadefuls of small ice a long way off and drag away the big ice-blocks. Every now and then we knock-off and have a rest. I took advantage of one of these breaks to go back to the camp and heat up the dinner.

August 21. To-day we are celebratng our traditional holiday—the jubilee of our landing on the ice at the North Pole. We have now been living three months in our ice camp. In honour of the occasion, I gave the lads a sweet course for dinner to-day. Before dinner we each had a tot of brandy.

We have worked so hard during the past few days that our arms and our whole bodies ache. On returning to the tent to-day from our work of clearing the airfield, we sat down for a brief rest, but instantly we all dropped off to sleep.

When I woke up I glanced at the lads and laughed outright: each one was sleeping in the same position and the same place in which he had sat down to rest. I decided to wake them all, but found that was easier said than done. It takes a lot of shouting and exhortations to wake the lads now, owing to the complete exhaustion from which we are all suffering, due to the very arduous nature of our work. The boys woke up at last, undressed, crawled into their sleeping-bags and once again went soundly off to sleep.

We are all deeply concerned about the fate of Levanevsky's crew. Our radio station keeps a constant watch over the air, which means that during the past few days we have been unable to contact our families; it makes the lads a bit anxious, for we are used to getting frequent news from home. A daughter has been born to Peter but as yet he does not even know what name she has been given. We all reassure him:

"Don't you worry old chap, the wife will give her a pretty name."

August 22. After breakfast we set off once more for the airfield.

We took flags with us, which we stuck in the ice to mark the boundaries of the field for the planes to land on. This time we were joined by Ernst. He brought the cine-camera, in order to take shots of various phases of our work. This only took him a few minutes, and then he joined us in clearing the field and carting away the ice. The work progressed more rapidly to-day; probably we are getting used to it.

We have already broken down the last big ridge of ice-blocks. It soon crumbled under the blows of our ice-picks. I cast a glance over the field: the hummocks and the icebank had disappeared, and the field was level. Now we all long for the frosts. If only the temperature would drop, our "flying field" would become much safer and we should be happier about the landing of the heavy planes.

At midday I returned to camp to cook the dinner; the lads went on with the job till evening. Suddenly the sun broke through the clouds. Although it didn't stay out long, it shone long enough to please Eugene Fedorov, who lost no time in ascertaining our position. In the evening we were already transmitting our new position to the mainland: during the last six days the drift has carried us slightly northwards.

Our morale has perceptibly improved. We are pleased at the rapid progress of our work. Also to-day we have been receiving radiograms from the mainland. Ernst had the greatest number. He sat in front of the radio silent, smiling to himself. But his spirits are lower than ours; he isn't well, and Peter, our doctor, has already taken him in hand. Peter says that Ernst is suffering from slight poisoning caused by sausage. He probably ate a piece that was bad. The poor lad has now been ailing for three days.

Peter rested for an hour after dinner, and then resumed work with the current-meters.

Eugene worked up the data of his magnetic variations.

August 23. Our day opens with a set plan, as in a military camp, and proceeds according to a strict timetable. Ernst wakes Eugene who goes off and carries out his meteorological observations, hands the report to Ernst, who in turn transmits it to Rudolf Island. Then we all assemble in the kitchen. We breakfast, drink our tea and have a smoke, after which we separate—each one to his job.

This morning Peter began work on his routine lowering of the current-meters. Eugene collected the tools preparatory to work on the airfield; but a heavy wet snow began to fall. We are afraid to get wet through, as we have nowhere to dry our clothes, so we called off our journey to the airfield and stayed in the living-tent. In our spare time we make flags to mark the boundaries of the airfield. I brought some black satinette into the tent (there was even some of this in our "departmental store") and cut it into lengths. We tied the flags to sticks.

The snow soon stopped, but the entire camp is blanketed in a thick and impenetrable fog. The outside world is shut away from us. Nevertheless, we decided to go out and finish clearing the airfield. Only Ernst was left in the camp and he continued to work at his radio station; he never removes his earphones.

Work at the airfield went well. We have finished clearing the icefield. As an added safeguard we decided to find another site and build a second airfield. We spent two hours examining every section of the floe, the ice-blocks and hummocks, but failed to discover a suitable site. Possibly we are hindered by the fog—everything is covered in a heavy shroud.

Eventually we decided to call a halt and renew our search to-morrow morning. Furthermore, Eugene announced that the barometer was rising, which means an improvement in the weather.

We returned to camp, and brought in all the tools, ice-picks and spades. Peter did not stop to rest but went straight off to his current-meters, while Eugene spread on his knees his notes on gravitational observations and began to study them.

Once again we have had an unexpected visitor which aroused great excitement: a gull has visited the camp. I dashed out of the tent and fired five times, but with no result. It is tricky shooting a bird on the wing.

In the evening we listened to "Latest Radio News." It was announced that Mikhail Gromov and his remarkable friends, Andrei Yumashev and Sergei Danilin, heroes of the trans-polar record flight had returned to Moscow from America. Moscow gave them a triumphant reception. Our hearts rejoiced for the gallent heroes. In our country it could not be otherwise. The people give full dues and honours to those who do good work. Well done, lads! Let the whole world know what our Motherland, our Soviet people, can do.

Before I went to bed I received a radiogram from Volodichka. On the mainland people have no idea how our hearts are gladdened out here by even the briefest message from our families and friends. How glad I am that Volodichka is off at last for treatment. When I re-read the radiogram I noticed it had been dispatched from Moscow on August 16, which means it has been on the way more than a week. I can understand why: the Arctic radio stations have been busy searching for Levanevsky's plane, and the transmission of personal messages has been held up.

August 24. We were all—Peter, Eugene and I—awakened by shouts of "Hurrah!" from Ernst. As usual, he had been on watch during the night, and in the morning he brought us news of fine weather. And he is right, the sun is shining, and there is a light frost—4 degrees below zero.

Ernst has not quite recovered from the unlucky sausage. He vomited during the night. I feel anxious when I look at him: his face is green, he has grown hollow-cheeked and thin. Shirshov swears and shouts because Ernst disobeys his instructions. He stands over his patient in the living-tent and admonishes him seriously:

"If you want to return home fit, just remember that you must obey every word of mine as if it were law. Otherwise I accept no responsibility for the consequences."

Ernst is very fond of his family, and naturally wants to return home fit, so he vows solemnly that henceforth he will submit without a murmur to any instruction Peter may give him, and that he will keep strictly

to the regime recommended by him. He has now stopped eating flapjacks and chocolate; he prepares his own "diet," consisting of rice pudding.

And so, poor Ernst has now been put on a diet. When we returned from the airfield to-day he had cooked us an omelette; as for his own nourishment, he sat alone, drinking tea. We were tired and hungry, and attacked the satisfying meal with relish; at the sight of us Ernst turned away; the temptation was too great to bear—the craving to share the meal with us too keen. . . . We sympathised with him, and suggested he should take a stroll round the tent while we were eating Ernst agreed, and went off.

After dinner the three of us took the flags and set off to search for a fresh site for an airfield. We covered a large area, going backwards and forwards over the floe; either there were too many pools of water, or the minimum area for a runway was lacking, or else the ice-blocks were too large, and it would take more than a day's work to clear them away. In short, we failed to find a suitable site.

Six hours later we returned to camp, and taking our tools set off once more to clear the old airfield. Here we worked till late in the evening, until our strength was exhausted and the ice-picks fell from our hands. It is hard to describe our complete exhaustion; slowly, we dragged our way back to the tent. . . .

On our return the first thing we did was to visit the kitchen tent and have a bite and a drink of tea, but with no vestige of appetite. Then we went back to the living-tent. The others all got into their bags, while I sat in a corner and wrote up my diary. But I could scarcely guide the pencil.

Later I switched on the loudspeaker and listened with great enjoyment to an opera broadcast from Moscow. It is very pleasant out here in a tent on the floe to be able to listen to Moscow, to music and singing. Peter hearing the music woke up and exclaimed:

"Why that's Moscow!"

"Yes that's our own Moscow," I replied.

After listening to the music all desire for sleep left me. I went out of the tent for an airing; the weather was fine, with a frost of 5 degrees, which is a good thing as the floods will freeze over and the surface of our airfield will harden.

Water is our chief enemy; damp and wet clothes induce rheumatism. As soon as a thaw sets in the water penetrates into our tents, creeps up the instruments, washes away the food dumps. . . . Though it is none too pleasant at 40 degrees below zero, we prefer to freeze rather than sit around in pools of water and damp. It's warm in our tent—8 degrees above zero; the Arctic sun is warming us.

During the night I received a radiogram from Moscow: we are asked to keep in touch with the flights which are to be made by the American Arctic explorer Wilkins, who is taking-off from Coppermine (North Coast of Canada) in search of Levanevsky's crew. We are carrying out all the instructions of the Northern Sea Route Central Administration.

All our communications depend on the wind: without it our windmill ceases to function, and we relapse into silence.

August 25. We go on with our job of clearing the airfield. Peter knocked-off for only one hour, to see to his current-meter. Like friendly hay-makers in a meadow, we follow one behind the other, breaking down the ice ridges, ice-blocks, and hummocks, carefully levelling the field. The work goes with a swing. I think it will be quite ready in two days' time.

On our way back to camp I drew the lads' attention to the sky; it had turned a dove-grey colour.

"Those clouds herald a storm," I told them, recalling the weather lore taught me by the Sevastopol fishermen, with whom I used to sail on the Black Sea as a boy.

Ships' captains dislike these storm signals, and directly they appear they make for the nearest harbour. Here, however, we have no sheltered coves or bays. Our only shelter is the tent, and we hurried towards it.

Hardly had we taken off our coats before Ernst reported that a strong wind had sprung up. Ernst wanted to charge up the accumulators, but something had gone wrong with the windmill charging plant. The brushes and distributor seemed to have become clogged. In spite of the rising gale, Ernst got a step-ladder, climbed to the top, cleaned them and made them fast once more. Only after this treatment did our "heart" consent to function.

Tired out, we undressed quickly, and crawled into our sleeping-bags.

Before dropping off to sleep we fell to discussing how long it would be possible for a man to live in complete solitude on an icefloe.

"I should think," said Peter, "that after a year he'd get used to it, and would no longer be worried by the absence of people."

"On the whole it's hard to live in solitude," I answered. "We know that all our work out here will be handed over to science, to the people; intercourse with one's own people always gives one extra strength and courage: it must be terrible for a man who has nobody. . . . Besides homesickness for your countrymen the longing to see and speak with family and friends is always a driving motive; it makes one long to return to the mainland as quickly as possible".

"After all," observed Eugene, "we're not lonely scientists. Each one of us has his own people."

"At every polar station I have worked at I soon got used to the loneliness," said Krenkel, who turned round, removed his earphones and joined in our conversation. "But during my first years in the Arctic I too went through difficult times."

"The radio is a wonderful invention," said Peter. "It not only abolishes distance, but brings people closer together; gives you the feeling that people are close to you, beside you."

"That's true," agreed Eugene who was just on the point of dropping off—a moment later he had curled up and was sound asleep.

"Let's turn in," I said. "There's a lot of work to do to-morrow—and a gale's blowing up," I added.

"I don't think you'll get to sleep in a hurry now," said Peter. "The gale it seems has already started."

Nevertheless, despite Peter's warning, we were soon asleep.

However, we were awakened by the violence of the gale during the night. The noise it made sounded as if at least a thousand devils were running across the roof of our tent. . . . Big raindrops drummed on the canvas, giving us no rest; outside the tent a strong wind howled.

August 26. The gale rages violently. The rain continues, and from time to time it snows. We hate leaving the tent, but we have to go out to do our work. Each one of us has his duties, his fixed periods of work, his routine requiring endurance and precision.

First, there were the meteorological observations to be carried out and transmitted to the mainland. This was performed, as usual, by Eugene. He returned to the tent wet through, and it took him a long time to get warm.

Next, the scientific work has to go on. Peter put on his oilskin and went out to lower the current-meter. Peter thinks the drift is now carrying us rapidly in a westerly direction. He'll probably come back soon and tell us whether his surmise was correct. . . .

Peter is shifting his laboratory; there are at least two bucketfuls of water in the tent where he keeps his instruments, and the rubberised flooring prevents it from seeping away; the water has turned the deer-skins into dirty, sodden rags.

Eugene usually examines the data of his scientific observations when the weather is bad. He has folded up both his tents where he makes gravitational and magnetic observations, and has covered up the instruments, in case the gale should overturn and damage them.

Our airfield, on which we have spent so much energy, is now unrecognizable. All the flags which we put round the floe, have been blown flat and snowed under. Snowdrifts have piled up all round our living-tent: the sledges also are snowed under, and to-morrow we shall have to search for them.

Peter tells us that before he can lower the current-meter he has to spend an hour shovelling the wet snow out of the hole. The motor is half snowed under, and the food dump has also vanished from sight.

As soon as the blizzard abates slightly we shall have to start digging out our buried gear. Such is our life: first we suffered hardships from the thawed snow, and now we are plagued by the blizzard, plus snowdrifts. We can see the snowdrifts are to be our inseparable companions on the icefloe so long as we live on it.

I set off for the kitchen. To my horror I found that the kitchen, too, was snowed up. I went in and saw snow and still more snow. It is very awkward working in mittens in the kitchen, but if I don't, my hands will freeze.

The barometer continues to fall.

August 27. The vileness of the weather has worn us down completely. True the rain has stopped, but snow falls incessantly.

Ernst was just about to turn in after his night watch when he remem-

bered the windmill had to be started and the accumulators charged up. Although the wind is strong and gusty, somehow the windmill fails to generate power. Ernst stood brooding, trying to fathom what the trouble was.

Finally the four of us went out to the windmill and dismantled it. A violent gale was blowing, but we gritted our teeth and stuck it out. We tested every wire with the amperemeter; the current was there, *all right! At last we found out what the trouble was: the box holding* two copper brushes had become clogged with snow, and the brushes were frozen. We quickly put it to rights, re-assembled the windmill and started it up.

We all got wet through, but we had successfully recharged the accumulators. This morning an exceptionally beautiful sight met our eyes. The ice had been in a state of stress during the night, and a vast ridge of multi-coloured ice had piled up opposite our tent. Peter discovered that masses of seaweed had become frozen into the ice, tinting it with different hues.

Our camp was greatly changed in appearance. Fresh snowdrifts, banks and hummocks have been formed. Before we could work at our hole in the ice, the snow had to be shovelled out. Peter was doing this job. Eugene and I went to give him a hand.

During the day we lowered the current-meter five times to various levels; so that despite the blizzard we have been able to determine the speed and direction of our drift.

Towards evening Ernst turned up at the hole and also assisted energetically in carrying out the hydrological observations.

We got wetter than ever to-day. However, we stayed out all the morning as we wanted to finish the work. We let Ernst off because he had to cook the dinner. Within an hour he called us, and we went back to the tent.

After dinner I brought in the primus, lit it and hung our shirts above it—our sole means of drying clothes.

While the shirts were drying Peter examined the water samples he had drawn up a few days ago: Eugene sorted out the data of his astronomical observations.

We have moved the scientific instruments into the living-tent, it is warmer and more convenient to have them in here. Our "palace" now houses a complex "academy": a radio receiver and transmitter, a hydro-chemical laboratory, office, and living quarters of the scientific personnel; one corner houses the cinematographic laboratory.

The outside temperature is 1½ degrees of frost.

During the evening I hunted out and dug up the sledges. There was no point in my touching the rest of the stuff as the snow continues to come down as thick as ever: one snowdrift is hardly cleared away before another is there to take its place.

August 28. Ernst and I were awake all night—he was on watch, while I, for some reason, felt very wakeful. We made a pot of tea, and sipping it slowly, enjoyed the warming drink, while we talked quietly

about Moscow. We could visualise clearly and precisely every single hour in the Capital. . . . It is night now, solitary motor-cars speed through the streets and vanish in the darkness ; an occasional pedestrian hurries home, to comfort and warmth. The all-night shops are quite full, and sales are brisk. Caretakers are sweeping the pavements. . . . Soon the first early morning suburban trains will be rolling in, bringing the "dachniki"[1] to work.

The blizzard continues unabated. Peter, disregarding the weather, rose and went off to the hole to carry out readings of the current-meter.

"After dinner we'll set up a complete hydrological station" he announced on his way out.

This work will take up a full twenty-four hours.

Eugene is working up the data of magnetic variations and atmospheric electricity. Now he examines the data of his scientific observations directly they are available, without putting off the work. To-morrow he intends to fix up the scientific instruments in his tent again.

Our floe is drifting very rapidly. Apparently we have taken leave of North Latitude 87°. If the sun appears to-morrow it will tell us our whereabouts through our astronomer Fedorov.

Ernst is constantly following by radio the course of the aircraft which our country has now sent out to the Arctic in search of Levanevsky's plane.

To-day we transmitted an article for *Pravda*. We have not sent an article to the newspapers for a long time, as our radio station has been so busy. But the editor of *Pravda*—our considerate friend—has sent us a radiogram asking for an article dealing with our recent activities. Somehow we managed to find time for the article.

After dinner the blizzard died down. I took my skis and went off to inspect the airfield. The flags were all blown down and snowed under. I had to put them up again.

When I had inspected the airfield I dug out the sledges and cases of food at the dumps. To-morrow I shall finish the job and dig out the remaining gear. On the whole my activities after a blizzard are more like those of an archaeologist than of the chief of North Pole Station.

I am trying to finish a second article for *Pravda* : "One Hundred Days on a Drifting Icefloe."

I have sent a short radiogram to Volodichka. I wonder how she feels out there ? I always think affectionately of my wonderful pal.

August 29. Once more we went out to inspect the airfield, but without the sun it is difficult to judge its condition. When we returned, Eugene joined the excavation work and later on erected his tent.

Peter cleared the snow out of the hole and proceeded to carry out observations with the current-meter.

In the evening I mended the kitchen tent. The canvas needed a patch ; the wind was already frisking around in the soups and borshches.

At the sun's first appearance Eugene determined our position. It is now North Latitude 86°55'.

[1] Town-dwellers who rent a country cottage for the summer.

I went on with the excavations, digging out the motor, the step-ladder, buckets and cases of food. Everything was snowed under, and had to be searched for and pulled out.

I was continually asking myself:

"What can have happened to the buckets?"

"Where have the cases of food got to?"

"Where shall I look for the sledges?"

"What can be the meaning of that hummock, recently sprung up near our tent?"

Ernst also made a tour of the camp, ascertaining by the size and shape of the mounds where to look for the sledges, step-ladder and ice-picks.

I never dreamed the snow would bury all our gear so quickly.

"And how are things at the dumps . . . ?" inquired Ernst on my return.

"I've just been there," I answered. "Everything is snowed under. It seems every time there's a blizzard we'll have to do a considerable amount of snow-shifting.

"And what if there's a blizzard every day?" asked Ernst with a wry face.

"In that case we'll have to clear our 'estate' every day, otherwise we'll find ourselves so completely buried that even a plane wouldn't spot us. . . ."

We drank our tea in the cramped new kitchen tent, set up while the old kitchen tent undergoes repairs. The frost is becoming perceptibly stronger and pleases us.

It grew cold in the living-tent during the night. We quickly dived deep into our sleeping-bags. Soon we shall have to "heat" the tent by putting on its eiderdown cover and lighting the primuses.

We turned in sooner than usual, as we have to get up early to-morrow and continue excavations. I am wriggling into my sleeping-bag now, and will try to warm up quickly and go off to sleep. The first essential for this is to empty one's mind of all thoughts. . . .

August 30. Peter patched the kitchen tent this morning and then went off to the hole in the ice.

I went out and cleared the snowdrifts from all three dumps. It is surprising how the snow fills up every nook and cranny. I made a ledge all round our living-tent, and plastered all the holes with snow; the frost soon hardened it and the result is quite an original cement. In addition I built a rough bench out of snow, near our tent; when we have nothing to do we can sit on this bench and meditate. . . . But shall we ever have the time? I hardly think this is likely before the end of the drift.

Ernst has again brought out his cine-camera and taken shots of phases of our work at the hole in the ice and at the winch. He managed to get shots of us lowering the bathometers and current-meters.

We erected the hydrological tent and then returned to camp for dinner. In the afternoon Peter made the tent draught-proof, using my method of stopping up the holes with snow, and then carried on with current-meter observations till late at night.

Fedorov's silk tent is rapidly falling to bits, so Peter has made a magnanimous gesture—he has given Eugene the tent in which he kept his hydro-chemical laboratory. Eugene has fitted it out as his gravitational observatory.

I would not advise anyone to take silk tents to the Arctic: the sun burns them out, and the wind tears them to ribbons in no time.

On the floe there is fog, the temperature is 5 degrees below zero. To the north of our field the ice has piled up to some extent, but the floe itself is undamaged.

We are now in the fourth month of our drift: so far everything has run smoothly.

August marked a considerable change in the position of our floe: we have moved seventy miles along a straight line at an average speed of 2.3 miles per day. The drift was particularly swift between August 7 and 12, when our floe covered forty miles in five days.

In August we established three hydrological stations: two at a depth of 1,000 metres, one at a depth of 4,000 metres. Another deep station was made useless by the rapid drift, when the cable jammed under the ice.

With the current-meters we carried out a series of observations in the upper layers of the sea of the current caused by the drift of the ice.

During August we also established three hydro-biological stations: one at a depth of 1,000 metres, and two in the upper layers of the ocean.

And there was another event to record: we were visited by a gull, flying from the south-west, from Greenland; she screeched us a greeting in her bird language as she flew past, then vanished into the distance.

August 31. We got up at 6 o'clock this morning and dug up the boards, sledges, plywood—briefly, whatever had been snowed under by the blizzard.

Eugene is occupied with gravitational observations. He need no longer worry about the instruments: now inside the living-tent, they will neither thaw nor lose their precision.

Peter went off again to the hole to carry out observations with the current-meters. By evening he had completed a series of observations of the drift and the currents. It is interesting to note we are once more drifting rapidly southwards.

After dinner Peter will empty the water containers in readiness for the next station he is to establish. To do this he will have to examine the samples taken in all the earlier observations. I foresee a sleepless night for Peter, but it will not be the first; Shirshov is used to working round the clock for twenty-four hours or more, without a break.

During the day the three of us took our skis and went to examine our fissure. There has been a considerable packing of ice around it. We sounded all the pack ice; it seemed quite firm.

We went back to the camp reassured, but on the alert: the season of autumn gales is now setting in, and we must be prepared to encounter all kinds of whims and tricks of weather in the Arctic.

Dickson Island relayed the Arctic edition of "Latest Radio News";

this was followed by a performance by the company of the Trans-Polar Theatre. The songs in the repertoire are good, but the voices of the artists are weak. We should prefer to listen to something richer, more stirring, to raise our spirits.

Peter went off to read the current-meter. He returned in the evening and announced:

"Our drift continues at its previous speed."

Not another word did he say, but undressed and fell asleep immediately; fatigue is beginning to tell.

SEPTEMBER

September 1. Eugene has now been glued to his instruments for two days without a break. He has fifteen minutes off in every hour. But even then he doesn't rest; he has to check the chronometers by the radio signals. To-day Eugene became so engrossed in his work that he was five minutes late transmitting the weather report to Rudolf Island.

To-day Eugene transmitted to Leningrad the results of his scientific observations. Whatever we achieve in our work we try to send over to the mainland by radio. The life of every explorer belongs to the people, and each grain of experience or knowledge gathered will live for centuries; the people treasure the results of its sons' scientific work. We decided, just in case—for, after all, we are living on an icefloe and not in a peaceful sanatorium—to send a long radiogram to the Arctic Scientific Research Institute. It began with the following phrases—matter-of-fact, but significant:

"During the period determinations of the declinational and horizontal component were made at twenty points; determination of the dip at ten points; variations have been registered for a period covering 170 hours. . . ."

Peter continued his readings with the current-meter, and by dinner-time had completed two series. During the morning he also set up in the living-tent the apparatus for distilling water. A primus was lit in the tent, and soon we were all feeling warm. To prevent the fur skins from getting wet I made a big tin tray, on which Peter placed the primus and still.

I got to work mending the primuses, as Peter had taken from the kitchen the only one in working order.

The temperature in the living-tent is 3 degrees above zero and outside it is 5 degrees below.

When we went out to inspect our icefloe we discovered new pack ice. Apparently more jamming had taken place in the night. The fissure has drawn closer to our camp and the icefield on which we are living is steadily shrinking.

The camp is now only 120 metres from the fissure, but we are not worrying, as in an emergency we can transfer to another, larger floe

(needless to say, this will only be possible if there is no serious jamming). But I think we shall be able to live out the polar night on our present field.

The wind has died down completely, and now another impenetrable fog envelopes our camp. We make our way from dump to dump with the greatest of difficulty; we have to grope to avoid falling into the fissure. However, we try to cut down our travelling on the floe during fog, as it is dangerous.

Peter worked at the hole for a long time and brought back twenty jars of water samples. Peter said in jest:

"I've brought back the entire population of the Central Polar Basin. . . ."

At midnight he placed the microscopic inhabitants of the ocean in bottles of alcohol. In this form they will travel to the mainland, where they will be carefully studied. By the way, some of the marine crustacea glow in the dark.

I am on camp watch while Ernst sleeps. The dampness is beginning to tell. Three of us—Ernst, Peter and myself—have pains in the joints of our hands and feet. Ernst says it is rheumatism. When we get back to the mainland we must take a trip to Matsesta; they will soon cure us there.

We told Doctor Novodereshkin (on Rudolf Island) about our rheumatic symptoms, and he gave us a lot of advice by radio. He told us to take hot baths at night and ten minutes after the bath to rub the joints with a compound of ichthyol ointment with some admixture; to sleep in gloves; in the morning to wash our hands in spirit soap, and to eat as much fat and vitamins as possible.

How naïve some people are! As is known, we have no bath. Neither have we alcohol necessary for the treatment. Even the alcohol for our scientific work has to be obtained from brandy.

We sent the doctor a facetious reply:

"Firstly, we have no bath; secondly, we are not clear about the prescription for the ointment; thirdly, if we should discover any spirit, even saponaceous spirit, we should use it for internal consumption. . . ."

We are feeling in fine spirits after this; cracking jokes all day long.

September 2. The day has turned out to be exceptionally fine: the sun is dazzling, the sky deep blue and boundless. Sunrise was at 4 a.m. Ernst, who keeps nightly observation of everything going on around us, woke Eugene:

"Now you will be able to carry out astronomical observations," he remarked.

Eugene quickly dressed, took the theodolites and left the tent. Afterwards he went off for a ski trip around the floe.

I, too, got up soon after Eugene and went off to examine the fissure. We have to keep a constant watch over it. As I approached the edge of the floe I again caught sight of a sea-hare. Could it be the old friend we had met before? The sea-hare was thumping the ice with his snout, but directly he saw me he dived into the water so quickly that I had

no time even to fire. I returned to the camp and announced the arrival of a new neighbour—a sea-hare, living next door to us.

I suggested to the lads that we should take advantage of the long-awaited fine weather and do some work with our cine-camera. I was keen to make a film record of the details of our life, with the often amusing conditions (despite the hardships), and the episodes in our scientific observations. I had to turn producer, and there was I telling Krenkel, Shirshov and Fedorov: "Bend down!" "Turn your head," "Don't laugh," "Don't stare at the camera." Members of the film profession will sympathise, the more so as my cast was not very photogenic!

Later that morning, after the shooting of the film, Eugene said that he thought we were already at the 86th parallel.

By dinner-time Peter had completed a series of current-meter readings and begun to take a depth sounding. It was late in the evening by the time he had paid out the lead to sea-bottom. Then we had to haul it up. We usually declare a "state of emergency" for this job, and turn the winch in pairs—Eugene and I, Ernst and Peter; each pair winding up 300 metres of cable.

The work is exhausting, but we are used to it by now. From my own personal experience I am convinced that if a man has a definite object which he is determined to achieve, he will overcome all obstacles, however great.

It was nearing 1 a.m. when we finished hauling up the lead. The depth of the ocean beneath us is 4,293 metres.

We returned to our living-tent; I had suddenly developed a headache, so without waiting for tea I swallowed a phenacetin powder. I am going to turn in now.

Usually, after we have dropped off to sleep, Eugene proceeds to examine his day's gravitational and magnetic observations. He works hard, in the effort to make up the time spent on clearing the airfield.

Peter decided to stay up to-night; after taking a short rest he went off to establish the routine deep-water station. It was 7 o'clock in the morning before he returned, tired out and chilled to the bone. When he had crawled into his sleeping-bag he muttered drowsily:

"Outside the temperature is 12 degrees below . . ."

And without finishing the sentence he fell asleep.

September 3. Since the morning Eugene has been studying magnetic variations.

I started to build a kitchen. We were the first in the Arctic to use wet snow as a building material. It appears that wet snow, from which we make ice-bricks, is both practical and strong as a building material. With these bricks we are putting up huts for our laboratories, a kitchen and store-houses. In a little while Ernst came out to help me. Together we worked on the building of the kitchen till 2 a.m. The work goes well, and I hope to have the kitchen ready in two days' time. We intend to celebrate its opening.

Peter had only three hours' sleep, and then went off again to the hole till evening, when he came back to the tent and once more lay down to

sleep. We were careful not to wake him; at midnight, however, he woke himself, dressed quickly and silently, and returned to his work at the winch. Peter still has a series of bathometers to lower to a depth of 4,000 metres, which means another twenty-four hours stretch for him.

Eugene, too, had only three hours' sleep. Nor do I suppose he is likely to get a sound sleep in the next few days, as we have so much to do.

Doctor Novodereshkin of Rudolf Island, in answer to our facetious radiogram, advises us once more, in as facetious a vein, to take care of ourselves. He winds up with the profound remark that "the warmth of the body is increased when a person keeps in his sleeping-bag, and also by including pea soup in his diet. . . ." This concluded our medical argument.

We carry on with the building of the kitchen. It is interesting to observe how the wet snow freezes, assuming increasingly regular shapes. If the experiment is a success and the kitchen turns out to be sufficiently strong, we intend to build a store-house of snow and huts for gravitational and astronomical observations. In a word, I already have a plan in mind for the construction of a complete ice-settlement or, more correctly, of a "polar architectural ensemble." It will be possible to realise this plan in the near future.

After we had come in from work, at 2 a.m., Ernst and I made some tea on a primus, and dried our suits. The problem of drying our clothes never even occurred to us until we came on the icefloe.

But who would have thought so much water would be found in these latitudes! Ernst puts on his earphones, while I sit down to write up my diary. I am so weary I can hardly hold the pencil; my arms ache from spade-work—wet snow is very heavy.

September 4. I am very happy: I have had a radiogram from Volodichka. How glad I am that at last she has gone off for treatment!

My young comrades—Peter and Eugene—have had another sleepless night, carrying out scientific observations. Eugene continued with his 24-hour series of investigations into atmospheric electricity, at the same time conducting observations of magnetic variations; while Peter was busy at the deep-water station.

Ernst and I went to bed at 3 a.m. We rose at 7 and began work on the building of the kitchen walls out of wet snow; two of the walls are already completed. Later Ernst helped Peter draw up the cable with the bathometers which had been lowered to a depth of 4 kilometres.

I spent the whole morning at "Kukhnestroy" (the name we have given to the "gigantic" construction job of the public catering establishment for the North Pole Station), simultaneously filling the post of architect, foreman, stone-mason, carpenter, plasterer, and even fitter! I did not knock off until Ernst came to tell me that dinner was ready.

After dinner, Ernst and I put up the remaining two walls of the snow kitchen. The job is very intricate: the snow has to be mixed with water, just as workers in concrete mix cement and gravel. We put up double shields where the future walls are to stand, holding them

steady with ice-picks. Then we bring up the wet snow and pack it into the spaces between the shields.

In the evening, Eugene came along to lend a hand. However, when it was time for the "Latest Radio News" broadcast from Moscow, we knocked-off and went back to the living-tent: we had not listened-in to our beloved Moscow for a long time.

I lit the primus, which warmed up the tent, and made the tea. And then, sipping our tea, we listened to the Moscow News.

Even Peter woke up, though he had only turned in an hour and a half earlier, after having gone without sleep for two consecutive nights. To our surprise, listening to the news seemed to freshen Peter up, and after it was over he went out again to the winch to complete the deep-water station.

The weather continues fine: frosty and clear. It is cold inside the tent: 4 degrees below zero. When getting ready to turn in, one has to remember a number of elementary rules: if one has undressed, one dives into a sleeping-bag like lightning, or the cold drives away all desire for sleep, and one tosses and turns endlessly, chilled to the marrow; the best way is to curl up like a child, one warms up much more quickly that way; if you imagine that you are not on an icefloe the sensation of cold vanishes much more quickly.

Just before going off to sleep I noticed that the barometer was falling, which means a change for the worse in the weather. During the night I went outside and saw that the barometer had prophesied truly: the camp was already enveloped in fog.

What we want now is a breeze, to turn the windmill; the accumulators have run down, and we cannot send even the shortest radiogram to our wives. We cut down on every word; for the last two days we have been intending to send a short article to *Pravda* on our life and work, but we keep postponing it as there is so little life left in the accumulators, barely enough to transmit the weather reports to Rudolf Island. Ernst has been waiting for the wind for four days.

On the whole, since the beginning of September the weather has been calm practically all the time. Light frosts, however, have already set in, and we are changing over to a winter regime. We have even pitched a tent over "Shirshov's hole," as we call the spot where Peter establishes his deep-water stations. This tent makes it possible for him to carry out his "cold and damp" scientific work in comparatively satisfactory conditions.

September 5. Eugene took our bearings. We are at Lat. N. 86°35′.

In the morning Ernst and I went on with the building of the kitchen walls. Soon Eugene came to help us. We completed the erection of the walls fairly quickly, and then started levelling them. I often think we put to good use our chief enemies: snow, water and frost. Within six hours the wet snow filled in between the two shields placed edge-wise turned into a solid wall of ice.

After inspecting the results of our architectural labours, I find we have built a luxurious and spacious kitchen. In a day or two's time we

shall get down to the job of warming up our living-tent by pulling an eiderdown cover over it. Then we shall build an annexe to join up the tent and kitchen under a common roof, and shall solemnly celebrate the opening of "the winter season" at the North Pole Station.

Day after day there is practically uninterrupted twilight. The sun is already very low on the horizon, and the pack-ice casts long blue shadows over the snow. Soon, very soon now, the polar night will be here. Farewell, dear sun, we shall not see your face again for a long time!

We made fast the windmill, the pegs of the living-tent and the radio mast. Then Ernst went off to cook the dinner, while I sat down to write an article for *Pravda*.

Peter finished a complete series of current-meter readings, had two hours rest and then went off again to the winch. I left the tent with Peter and walked with him some of the way; I had decided to give the walls of the ice kitchen a final cleaning down.

We are again faced with the "drying problem," which is cropping up with increasing frequency. It is most uncomfortable when our wet clothes freeze. Our fur outfits turn into ice suits. We have to return to the tent and light up the primus, then streams of water run from our shirts and hooded deer-skin coats.

I am still unable to send a radiogram to my wife in Kislovodsk: we continue the stringent economy of power from the accumulators. To-day we even had recourse to our so-called "soldier motor," the bicycle generator, to work our radio station. We were compelled to do this as there is no wind and the accumulators are practically run down. By using the "soldier motor," which we operate with our hands and feet, we were able to send two weather reports and three personal radiograms to the mainland. True, when the radio station is working we have to expend a great deal of energy turning the motor, and we have quite enough to do without this extra task.

The frost keeps up; the temperature in the tent is 3 degrees below zero.

September 6. This morning we had great difficulty in transmitting the weather report to Rudolf Island. We all did a spell of turning the bicycle generator. Afterwards Eugene and Peter went off to examine the state of the ice.

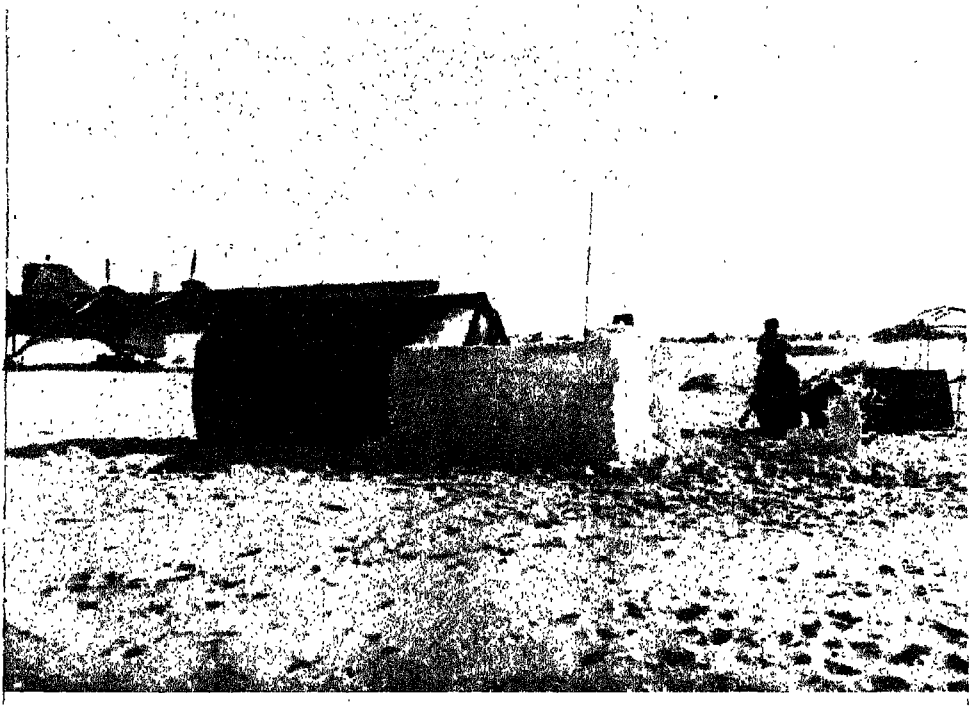
Ernst turned in, having been on watch, while I carried out current-meter readings.

Later I woke Ernst, and we resumed work on the snow buildings. Now we are building a storehouse. By the time the "expedition" (as we facetiously dubbed the ski-trip taken by Eugene and Peter) returned, we had already put up two of the storehouses.

Our scientists reported that the icefloe had been lucky during the last ice jamming; throughout the entire region there is no other icefield as level and undamaged; everywhere else huge ridges, pack-ice, fissures, and small broken ice have been thrown up.

Obviously the ice in our region has been in a state of severe stress.

My heart filled with anxiety. . . . But not one of us spoke our secret thoughts.

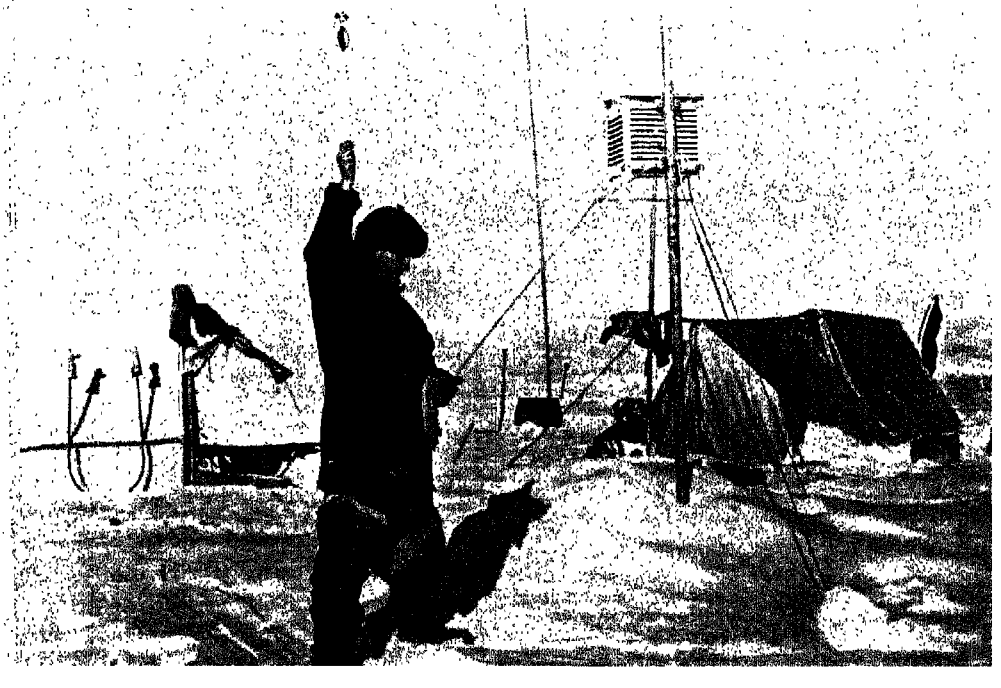


Building auxiliary accommodation from snow bricks

At the North Pole. Making a hole in the ice

The Papaninites' living tent. In the foreground, boots drying

Fedorov making meteorological observations



I have decided to investigate carefully the position in the entire region. Peter and Eugene have already inspected the south. Ernst and I intend to inspect the north side.

After dinner we agreed to transmit a long article to *Pravda*. It will take three hours of turning the bicycle-generator to do this; there is no wind, and the vanes of the windmill hang helplessly. . . .

We lost no time in transmitting to the mainland our opinions on the prospects of the drift and the results of our observations. We have now been working on the icefloe in the Central Polar Basin over 100 days!

Looking back on the past, we remembered all the work Soviet polar workers had to do before we could establish a station at the North Pole —the big aviation base on Rudolf Island that had to be made; the specially heavy 'planes that were built; the equipment designed and made for the station; the special foodstuffs prepared for us, foodstuffs which were most nutritious and kept well; the conformity of every article we took with us to the principles of lightness, strength and reliability. The ordinary polar station with a staff of four men set up on a new site on the mainland, and having a year's reserve of equipment, weighs 200 tons. Our weight limit was 9 tons, including that of the men; even our dog Merry was reckoned as weighing 30 kilograms.

An enormous amount of labour was expended on all this. Has it been justified? Some Arctic scientists doubted the successful outcome of our venture; they wondered whether it would be possible to carry out precise scientific measurements on drifting ice; the frequent packing of the ice, the fissures, the hard camp life itself, would limit us to the very simplest observations; our plan of work seemed to them too ambitious. However, we are successfully overcoming each one of these difficulties and have developed extensively all the investigations included in our programme.

We suffered great inconvenience from the icy water; the intense thaw necessitated a constant shifting of our "laboratories"; the blizzard tore fiercely at our lightweight tents. . . . Our hydrological instruments need constant attention to prevent them from freezing. After each blizzard we have to settle in afresh. Still, on the whole, I do not think things are going too badly!

The station equipment turned out to be exactly right, in spite of the novelty and strangeness of our life. For instance, our gigantic felt boots, with the deep galoshes, which according to Ernst could serve as a bath for a new-born babe, and which looked so absurd in Moscow, have earned our gratitude: they keep our fur-stockinged feet warm. Our shirts of reindeer skin and our sealskin trousers are very comfortable, and during the night, however cold it may be outside, we keep warm in our excellent wolverine sleeping-bags.

At first we proposed to transmit weather reports to Rudolf Island only once a day, but the reliability of our communications have allowed us to transmit four weather reports a day, which are entered on the general synoptical maps.

When preparing for the expedition, I decided to dispense with the

classical pemmican and chocolate of earlier polar expeditions. We took with us mainly concentrates; these have proved their suitability for distant journeys. Time is the only really acute shortage we suffer from on the floe. We four are doing work which is normally carried out by polar stations with a staff of not less than ten men. We haven't even enough time for sleep. All the same, we feel fine, we have got used to the work and have proved ourselves hardy. This, in the final reckoning, is one of the decisive requirements for living on an icefloe. We are full of strength and energy.

Such is the balance-sheet we drew up after considering our first three and a half months on the drifting floe in the Central Polar Basin. This provided the material for our article for *Pravda*.

After we had finished transmitting the article, I suddenly felt pains in my heart. Apparently this is the result of the great physical strain of operating the "soldier motor." Peter gave me some drops but I spent a sleepless night.

Ernst, too, lay awake for two hours in his sleeping-bag, tossing and turning; several times he urged me: "Come on, let's get to sleep!" but no one could sleep. Eugene and Peter, too, had a wretched night. We were all tired out.

But it cannot be helped. Of the two petrol motors, one is out of order; the other we are saving against a rainy day. We are not the best of mechanics, and so we are taking great care of it. If the windmill should break down, the motor will come to the rescue. For the present, when the accumulators want re-charging and there is no wind we have recourse to the "soldier motor."

I left the tent to have a look at our gear. I covered it up a bit better, then took a turn round the floe, came back and crawled into my sleeping-bag, but still I was unable to sleep!

Ernst, also, went out and wandered round the camp for a long time. On his return he announced:

"The wind is rising a little, thank goodness."

Thick grey clouds have come right down on us. Indeed, I have never seen clouds like these before.

The end of the polar autumn is very near now, winter will soon be here.

September 7. While Ernst was on night watch he built another half of the storehouse wall. Now only the roof remains to be put on. After this, Ernst and I straightened out our radio equipment.

Eugene and Peter are occupied with literary affairs: writing articles, notes and scientific reviews.

On the whole, there has been a noticeable increase in our activities as newspaper correspondents from the floe since we put the bicycle generator into action. Before we depended on the wind, now we rely on ourselves. As we are supplying power to Ernst's radio station, he willingly transmits our literary efforts to the newspapers.

We again made a trip on skis to inspect the whole of the ice-field. Passing the fissure, this boundary of our world, we came across an old

field of considerable size covered with smooth, wind-swept hummocks. Kilometre after kilometre our way lay through old pack-ice, on which now and again we climbed to see if we were going in the right direction.

About six kilometres from the camp we came across a big fresh-water lake. Its surface of ice, level as that of a skating-rink, stood out grey against the white snow. How strong our floe must be to withstand such a big lake. Only a few days ago there was much movement at this spot, the ice was cracking and breaking up. Jagged floes piled up in high ridges. The snow had not yet smoothed out the fantastic greenish shapes. To live here would have been uncomfortable.

Twice the sun broke through the clouds and Eugene made an astronomical determination. Our position is: 86°34′ N. Lat., 0°05′ W. Long.

We have hardly drifted at all in the last few days. This was so strange that we decided to check at once and went off to the current-meters.

September 8. Ernst finished building the ice storehouse last night while on watch; he also put up part of the roof.

Peter carried out observations with the current-meters, while Eugene studied magnetic variations.

The weather is very fine, the sun shines brightly all the time. The frost is becoming more intense. We have started heating up our living tent. Declaring a "state of emergency" in the camp and suspending all scientific and domestic activities, we shifted our gear out of the tent. Soon the radio, meteorological instruments, fur skins, knapsacks, etc., were spread on the floe.

We unlaced the tent and removed the top slip-cover. Then we unpacked the eiderdown coverings, pulling them first over one wall then over the other; on top of all this we put a tarpaulin cover and quickly laced up the tent. We carried in the fur skins and spread them on the plywood and rubber flooring; we put the bunks on the deerskins, fastened down the radio desk, and set up the instruments.

And so we have now moved into our winter quarters. Ernst says jokingly:

"The dacha[1] season has come to an end."

We cooked dinner and had our first rest in the heated tent. Actually, we did not rest, but simply tested out the warmth of our dwelling or, as we call it facetiously, "The Central House of the North Pole."

To get into our living-tent now we have first to pass through the lobby and kitchen, removing our felt boots in the lobby.

We lit the paraffin lamp, which will burn continuously till the end of the polar night. I have had to accept the vacant situation of "Lamp-tender of the North Pole."

Peter lit the primus to heat up water for his hydrological work, repeatedly leaving his English book to attend to it.

September 9. Ernst always finds himself some job when he is on night watch. Last night, for instance, he made us some flapjacks.

This morning Ernst lay down to rest, while Eugene and I set off to finish the roof for our ice kitchen. When Peter had lowered the current-

[1] Summer country cottage.

meter, he also came and lent a hand. The three of us spent all day working on the kitchen. It is quite ready now. To-night Ernst will flood the entrance with water, and to-morrow we shall celebrate: we are going to cook our dinner in the new kitchen.

Though Peter was working with us the whole time, his study of the drift was not interfered with. At the appointed time Peter went off to the hole in the ice.

"To-day the drift has increased," he reported on his return.

The weather is overcast, and the sky gets darker and darker. The polar night is drawing near.

Since the measures we took to heat the tent, it has become dark inside; the lamp now burns day and night.

September 10. At last a strong wind has risen. But this is not to Eugene's liking; he has had to fold up his tent, or, as he puts it, "close down the magnetic post." It looks as though Eugene will have to employ our method and build himself an ice house, to take the place of the tent, then the wind won't worry him.

To-day we cooked the dinner in our new kitchen. It is fine and roomy. This was our first polar house-warming, with the wind howling across the tightly-stretched roof. The transparent walls of ice, which let through a blue light, form an excellent protection from the wind. We have cut away some of the ice floor and covered it with plywood. We have fixed up a loudspeaker in our new kitchen, and listened to a concert from Moscow.

Strong north-west winds are driving our floe along swiftly. The barometer is falling, and the sky is overcast.

After dinner I tidied the kitchen and put up shelves by freezing the boards into the ice walls. Then I put away the cooking utensils on the shelves, hung up the lamps, and swept the lobby. The kitchen is now so spick and span that the best housewife might envy it. I brought two cans of oil into the kitchen for the primuses and lamps.

In the evening we drank our tea in the kitchen, and we all felt in fine spirits. Ernst, who fixed up the kitchen loudspeaker, again treated us to a concert, and over our tea we listened to music and songs from Moscow.

After the concert Peter went off to read the current-meter, and check up on the speed of the drift; it was 1 a.m. before he got back.

September 11. We have packed emergency supplies on to three sledges. We are bearing in mind the fact that ice-jamming may occur, in which event our tent, together with the dumps, might quite likely set off on a "voyage" to the bottom of the Central Polar Basin. As a safeguard, we decided to create a reserve of food, fuel, clothing and tents as a "mobile unit," on sledges. We shall guard this unit as the very apple of our eye.

Eugene is putting into execution his plan of building a nice hut for the laboratories, and is making the walls of wet snow. He spent all day on this job. Ernst gave him a hand for a bit, and I also helped in the evening.

During the day I checked up on the state of the airfield. After each blizzard the surface gets more and more level. This is the only useful bit of work the blizzard has done.

In the morning Peter went off to the ice hole to make a series of current-meter observations on the drift and the currents.

In the living-tent the temperature has already undergone a marked change, it has become much warmer. Outside it is 8 degrees below zero, while in our "palace" it is 7 degrees above—we shall be quite snug.

We have arranged to send over a number of newspaper articles: Ernst and I are to send articles to *Pravda*, Eugene to *Komsomolskaya Pravda*, Peter to *Izvestia* and *Leningradskaya Pravda*. For several hours we all sat in the living-tent, writing. After Ernst transmitted the articles. I cooked the dinner instead of Ernst so as not to take him from his work. We had mushroom soup, rice pudding and cranberry jelly to finish up with.

Ernst has made numerous unsuccessful attempts to contact Barentsburg on Spitzbergen. Apparently the chaps out there are not radio operators, whom I have always thought of as industrious people, full of initiative and interested in their work, but indifferent job holders. It is imperative for us to contact Barentsburg, for with each new day we draw nearer to the Spitzbergen latitude.

After tea I went off to examine the state of the fissure.

While at some distance from the fissure I caught sight of the sea-hare swimming among the floes. I rushed back to camp for my rifle, crept quietly up to the fissure, but the sea-hare had already dived out of sight. And I had been fondly imagining what a treat it would be to have sea-hare liver and rissoles for dinner! The animal had apparently guessed my intentions, and preferred to keep his distance. With true hunter's zeal I went on stalking him for a long time, but failed to get even one shot at him. Finally I returned to camp, for by then I felt very cold.

Those who, like myself, are fond of hunting will understand my keen disappointment. On my way back I repeatedly turned and gazed at the fissure but it was plain that the sea-hare was loath to give me the smallest satisfaction by showing himself. How unfriendly he is! Surely he doesn't receive visits from human beings so very often. However, there was nothing to be done; frost is a serious thing which you cannot play about with, and I had to get back home. Suddenly I thought I heard a splash, and defying both wind and frost, I started off in the direction whence it came; but soon all was silent again. Had I only imagined it? I turned and ran quickly homewards to escape further temptation.

A strong north wind has risen, but we are warm inside the tent. I got thoroughly warmed up over my tea, and after listening to quite a number of quips and sarcasms about the unsuccessful hunt, dropped into a sound sleep.

September 12. Peter is establishing a hydrological station.

Eugene continues to mould his snow laboratory, having quickly got into the knack of this new form of building.

For to-day I have turned tinsmith, and am making stands for the paraffin lamps out of empty food cases.

Eugene only left his snow building to determine our position. The sun has already sunk very low; soon it will abandon us altogether. Eugene will then have to make his astronomical determinations by the stars.

Eugene has computed that we have "travelled" 25 miles in five days.

Ernst is trying to contact Barentsburg, again without success. Ernst makes no attempts to conceal his exasperation.

"And they call themselves radio operators!" he exclaims angrily.

Definitely I seem to have no luck hunting. In the afternoon I took my rifle and set off for the fissure, sure of success. While still some way off I sighted a seal swimming in the water. I fired three shots and killed it, but in a twinkling it had disappeared under the ice. How disappointing! I was longing to give the boys some fresh seal liver. I must go out again to-morrow with my rifle, and try to do better than this.

My lack of success lately in this field is really astonishing. I am already thinking up thousands of excuses, but whatever the cause, it is still the hunter who is at fault. Eugene tries to reassure me, saying that the dead seal was drawn under the ice by the strong drift. Assuming that to be true—it makes it a bit easier to bear. After all, I did kill the seal, that is a fact.

We got into our sleeping-bags at 1 a.m. and listened to a fine concert by "The Red Banner Concert Party" of the Red Army. Professor Alexandrov was conducting the concert, which was relayed from Paris; the Concert Party is at present touring Paris with tremendous success. We were doubly pleased: firstly, we were listening to familiar songs we loved, which made us both sad and happy; secondly, we seemed to be sharing in the great success of the Red Army Concert Party in Paris. We could hear the thunder of applause in the enormous concert hall. The shouts of "bravo" and "*bis*" reached us out here at the Pole. We had reason to be proud of them; the Concert Party was performing the best numbers of its repertoire.

We asked the comrades on Rudolf Island to send a message, via Moscow, to Professor Alexandrov in Paris, telling him that the northernmost listeners in the world send their sincere greetings to all the musicians, singers and dancers who are earning such a high reputation for Soviet art abroad.

Peter returned to camp very late—at 2 a.m. During the day he had established a hydrological station at a depth of 1,000 metres and carried out a complete series of current-meter readings. We told him about the concert. Peter was very disappointed that he had not been able to hear it.

September 13. Eugene is moving all the gravitational instruments and pendulums from the living-tent into the ice observatory. He set them up, checked them, and then, without pausing to rest, started working straight away. For ten hours he never left his new ice hut. He speaks highly of its stability and convenience.

Peter, taking advantage of the reduced speed of our drift, again

lowered the lead to the sea bottom. The Central Polar Basin has become unexpectedly "shallow"—the depth is 3,767 metres, 526 metres less than at the last sounding, which was made only 32 miles north of our present position.

Samples of the sea-bed were almost entirely of a light brown colour.

During the sounding at "Shirshov's hole" fluctuations were observed in the level of the water. The hole was covered with thin ice, in which an opening had been made for lowering the cable. Suddenly water splashed up from this opening. Afterwards, the level of the water fluctuated for several minutes, alternately rising and falling half a centimetre.

It seems that these splashings and fluctuations reflect a violent jamming of the ice taking place at some distance from our station. Despite the absence of wind, the icefloes continue to move, pressing hard one against the other.

Although it was very late, I was not sleepy, whether the wakefulness was due to thoughts of Moscow or because of what Peter said, I don't know.

Our living-tent gets quite hot in the evening, when we are all mustered and two lamps are burning. I don't think we shall freeze during the polar night. At any rate, it's a long time since we have lived in such warmth.

I made some tea, and we squatted on the skins cross-legged, in Eastern fashion. We talked for a long time, joking and telling stories.

Peter felt a distinct tremor while he was carrying out his latest series of current-meter observations, which may be a sign that our floe has developed a fissure. During the night I went out to see if a fissure had appeared, but I did not notice anything suspicious.

During the day Ernst loaded the cine-camera and took some shots of Eugene working the pendulums. He kept close to Eugene's heels while he carried out the meteorological observations. This has now become the subject for many quips and witticisms, at which Ernst is an adept.

Peter has gone off to the winch.

"I've a few jobs to do there," he informed us.

"A few jobs"—that will keep him till morning! He works with all the greed and passion of a true explorer. I often marvel at the thoughtful and conscientious attitude of Eugene and Peter towards their scientific observations! They try not to miss a single thing, They take no account of time, work hard and untiringly, often doing without sleep for two consecutive days and nights; they carry on in blizzards, in rain and in fog. Because of their industry and perseverance, I feel sure we shall bring back to the mainland scientific material of the highest quality and value.

To-day the sun peeped out for a few moments. Eugene, naturally, took advantage of this brief spell of sunshine to make astronomical observations. The sun did not stay out long enough, however, for him to determine our position.

Now the sun is hiding from us. It breaks through the heavy grey clouds—as if to ascertain whether we are still on the floe. We are still here, dear luminary, but life without you is very lonely and dull!

I dug out the summer hydrological tent, which had been snowed under by the blizzard. Afterwards, taking my rifle, I set off for the fissure. True, I no longer expect successful hunting, but still it is livelier to set off with a rifle. The fissure has widened and is now 300 metres across. If a high wind were to blow up near the fissure, it might cause us a lot of trouble. From now on we must keep constant watch over the fissure.

When I got back to camp I filled up the primus, heated the dinner and then woke Ernst. After the meal we both set to work again on the building of the storehouse roof.

Peter is examining the data of the hydrological station. He sits huddled up over his entries and phials, just like an alchemist. I do my best not to disturb him.

It means a great deal to a man if he is engrossed in his job. But it means still more when he loves those daily painstaking experiments which lead to great discoveries. Peter, this young scientist, of Soviet upbringing, is in that stage when each tiny detail is significant and exciting, acquiring especial meaning in his eyes.

There are times in one's life—and this I know from experience—when in order to attain one's objective one has to muster all one's will, energy and knowledge; to subordinate one's feelings to this objective; when, finally, one must muster all one's inner resources, potentialities and experiences. This is exactly what we have done, all of us on the drifting icefloe in the Central Polar Basin. And this is why we are so confident of the successful solution of every scientific problem, however difficult it may appear to be to those watching us from the mainland.

September 15. We have decided to build another ice storehouse; we are trying, as far as possible, to extend the territory occupied by our "polar estate," not to concentrate everything in one spot. If anything happened to our food supplies our drifting expedition would be compelled to wind up its activities altogether! But if one dump should sink we would still have two dumps to fall back on. . . . In any case, we need another storehouse.

Peter, after titrating the samples from the station, repaired the current-meters. He is planning to write an article on positive temperatures at the Pole, at the request of the editors of *Pravda*.

I, too have to produce an article: "A Day on an Icefloe." But it's very difficult to describe every incident, all our hardships and pleasures, to give an exact picture of our life. Perhaps later, when we return to Moscow, it may be easier.

After tea, Eugene conducted gravitational observations. He has also succeeded in making an astronomical determination: we are at North Latitude 86°04'.

I have had a radiogram from Volodichka; she is resting in Essentuki, and she tells me she is feeling well and may possibly go on to the Crimea,

to familiar places. For her own sake, I am so happy! She and I have been through difficult times together, but she bore them with all the fortitude and staunchness of a loving comrade. Volodichka is my true ally!

After dinner I carried on with my architectural jobs, i.e., building the storehouse with snow, which material we are now using for building purposes on the whole of our "settlement."

Peter and Eugene were working up the data of their scientific observations.

September 16. Eugene is carrying out a 24-hour series of observations of magnetic variations. On these occasions we never see him for the whole of that time. We make a point of not worrying him or distracting him from his job. He has plenty of room in his snow hut, also he can carry on with his work there during the worst blizzard. Now, Eugene's labours are no longer at the mercy of the weather, which formerly used to put a stop to all our activities.

To-day we had a conversation with our friends on Rudolf Island.

They greeted us and told us of the interest the entire country is taking in our venture. They told us the latest news from Moscow: an air expedition sent out from Moscow has arrived on Rudolf Island to conduct a search for Levanevsky's plane. After telling us this, the comrades relayed to us by radio telephone some gramophone records which were especially made for us. In these records we heard the voices of our nearest relations. Such things give great pleasure to men in the Arctic, particularly when they are on an icefloe.

Our comrades inquired as to the state of the airfields. We told them there were two suitable landing fields on our floe, and that the runways were good. The remaining bumps and hummocks were not steep, no more than 30 centimetres high. The layer of snow is thick but not firm. Usually we have three to four days of relatively clear calm weather, followed by five to six days of heavy cloud and wind. Now, as it happened, the weather had changed to the latter, with west and north-west winds predominating. We four would be only too pleased to welcome our airmen friends on the icefloe, with which they were already familiar.

That was all we told our comrades on Rudolf Island.

My spirits rose immediately.

When the conversation was over, Peter went off to the hole to lower the current-meter, while I set to work again on the storehouse roof.

I have tested our new invention—a roof made of ice. At the first test it broke, so I strengthened it and froze it thoroughly. We can now rest assured that this roof will serve us for a long time. In the matter of building we are certainly making great headway.

It was 3 a.m. when I got into my sleeping-bag.

September 17. Eugene has had no sleep for 36 hours; he has been working all the time in his snow hut. I looked in on him several times, and begged him to take a short rest; but only when he had finished working up his observations did he consent to return to the living-tent; then he crawled into his sleeping-bag and dropped off immediately.

without uttering one word. We can all understand this—he was completely exhausted.

I went out and helped Peter haul up the hydro-biological net. We drew up from the Arctic Ocean numerous small fauna: crustacea, medusae and many other inhabitants of the polar seas.

The weather to-day is wild, with a blizzard raging. I am sure we have never seen a blizzard as violent as this one. Our floe is being driven along at a furious speed, and all our gear is again snowed under. Still, we do our best to put things straight as quickly as possible.

The current-meter, which Peter lowers regularly every six hours, shows that the speed of our drift is as much as 300 metres per hour.

In four days' time—on September 21—we shall celebrate a triple jubilee—six months since we took off from Moscow, four months of life on the icefloe and the equinox.

Krenkel has just returned to the tent.

"The gale velocity is 15 metres a second," he informed us, adding: "There are tremendous snow-drifts piled up everywhere."

Ernst sat down and avidly ate some hot soup to warm himself. The frost is severe. Because of the steam rising from our bowls, we can hardly see each other's faces.

We have left N. Lat. 86° and are constantly studying the map; after every gale we reckon up how many more miles we have to go to the 80th parallel. However, this frequent examination of the map does not indicate that we wish to quit the icefloe as soon as possible. We none of us entertain such a wish. On the contrary, when we were informed that the plan was to remove us not by 'plane, but by icebreaker, we were all overjoyed; obviously we should go on drifting till we reached regions accessible to ice-breakers, and would thus be able to fulfil the whole programme of our drifting North Pole Station.

September 18. After tea Ernst and I cleaned the contacts of the windmill. The grey whirlwind of snow is pierced by the brilliant hues of the perpetual sunset; but the gale is abating, its gusts are less violent. If we could put the windmill right we could charge up the accumulators. But this is the first opportunity we have had of climbing the windmill; the blizzard has been raging the whole time, and the wind kept blowing the ladder down.

When we had cleaned the contacts the windmill started turning quite well, so we began to charge up the accumulators.

Ernst returned to camp to sleep while I went off to bring in paraffin supplies, and clear the snow from the sledges. The tent is surrounded by immense drifts. This is probably the toughest part of our life on the floe: every time there is a blizzard we have to clear the snow from every trifle outside the tent. On such occasions we turn into archæologists, and wander over our ice settlement trying to recover our possessions as after an earthquake. I have already mentioned this repeatedly in the diary, but the very fact that one writes time and again about these snow clearings is sure proof of the intense hardship the drifts cause us. The snow has not packed down yet, so when we are "on the march" we

sink into it knee-deep: we have to go on skis from storehouse to tent, or from living-tent to kitchen.

I have had to make a new still for distilling water, using the old worm. It is difficult in our living conditions to make any apparatus. I had to use my knees as a vice, but they were not firm enough, especially in fur trousers, and I wasted a lot of time. My raw material consisted of empty food tins.

I had the worm ready an hour before dinner, so I went off to finish putting the snow roof on the storehouse. Peter came along and lent a hand, holding the sheets of plywood, while I made them steady. By dinner-time we had covered half the roof with wet snow.

We ate our dinner with relish. True, "relish" is a very relative term for the taste of smoke is practically ever-present in our soups and porridges. However, I have learned that one can get used to the taste of smoke and soot, those constant companions of bad cooks.

After dinner I had a short rest and then left the tent. With Eugene's help I finished building the roof.

Peter inspected the new still and expressed his satisfaction with it, although the "technical control" was somewhat capricious. And so, I have acquired one more trade—that of tinsmith! But all trades are useful, and come in handy.

Eugene has now gone off to his snow hut. He is delighted with his new observatory, though it still lacks doors.

Peter checked up the current-meters, which he brought into the living-tent, and then went off to the winch, for a "hydrological night," as we call Peter's tireless nocturnal observations and depth-soundings. It was nearly morning before he returned.

I shall stop making further entries in my diary till morning—I am dead-beat.

We took advantage of a brief interval in our work and crowded round Ernst, the "magician" who "tours the world" in the hours of darkness. We put on earphones and listened to a broadcast from Rudolf Island: we learned of the battles, defeats and victories in Spain and China. Afterwards we had a long discussion on events in the West and in the Far East.

In the evening we listened, as usual, to "Latest Radio News." My radiogram about life on the icefloe was read out. It is encouraging to hear what a lively interest is still displayed on the mainland in our activities.

Every creative effort in our country is followed with intense interest. Our research must be necessary to the people and we wish we could work even harder than we do.

After we had listened to "Latest Radio News" we somehow lost all desire for sleep. We were too excited by the broadcast, and instead of resting we decided to do some more work on the storehouse.

It was nearly morning when I returned to the living-tent. Peter showed up soon after. He has definitely established that the reverse current caused by the drift of the ice is found at different levels of the

North Arctic Ocean. Again we could not fall asleep, for we were discussing this interesting discovery.

September 19. Immediately I got up this morning I set to work making new doors—one for the storehouse and one for Eugene's observatory. By dinner-time I had finished both doors and fixed them up.

Winter and the dark are increasingly claiming their rights: a temperature as low as 26° below zero in the middle of September is rare in the Soviet section of the Arctic. Presumably it is due to the climate of Greenland, which is known for its severity.

Under the thick layer of ice we still find pitiful remnants of the water-drainage canal we used in the summer months. At that time it helped us with our cooking. But soon the "water supply" will close down and we shall be compelled to thaw ice for the water we need.

In place of trousers and shirts we now wear fur over-all suits. We can no longer work with bare hands. We can no longer take photographs and the cine-camera has been given a long leave, until daylight appears once more. We are getting used to the yellow light of the oil lamps. Rarely, and then only for very brief periods, does the sun make an appearance, or as we put it, "look in on us." On these occasions Eugene hastens to determine our position. It so happened to-day. Taking advantage of the sun Eugene made several astronomical determinations.

Our position is N. Lat. 85°52′, E. Long. 0°. Thus we are once again "squatting" on the Greenwich meridian, as if we were drawn to it by some mysterious under-water force.

Peter spent a long time working with the current-meters. When he returned to the tent he announced:

"We've stopped drifting!"

The wind, however, is increasing, and presumably we shall again be driven back a bit to the north. Already snow-flakes are whirling round the tent—sure signs of a blizzard. But neither snow-storms nor blizzards have any terrors for us now, as all our gear, down to the last piece of string and the last shaving, are kept in strong ice storehouses.

Peter says that backwards our "wagon" is making heavy going, as though the wheels were in need of oiling, and he, too, glanced up at the sky, as if trying to judge the possible force of the wind.

I always like frosty, clear weather; under a clear sky, we feel the sharpness of the frost, and the brilliance of the stars is a joy to us. At night everyone sleeps peacefully and does not wake in the morning with the anxious question: "How's the wind?" Briefly, with no blizzard life is much easier! But we soon got used even to blizzards. . . .

Peter used the new still to distil water. It so happens that the worm I made is better for distilling water from ice than the one made in Leningrad which we brought from the mainland. I am glad my labour has not been in vain, especially as I burned my finger badly with molten tin in the process of making the worm. I have been in agony all day on account of it. It is just as well that I am constitutionally tough.

In the evening I again dug out all our gear; as I have already mentioned, this has to be done after every blizzard.

I received a most encouraging radiogram from my brother Sasha. I am very fond of this brother of mine; he is an intelligent, staunch Bolshevik. I can't understand why I have not heard from him before.

We are preparing for the holiday: in two days' time we shall have spent four months on the floe. After Ernst had transmitted the weather report to Rudolf Island he heated some water and proceeded to shave. It must be two months since we last shaved. Last month the blizzard prevented us from shaving, also we had more important matters to attend to.

Peter is diligently studying English: he devotes an hour to this each day before turning in.

At last the blissful moment has arrived when I can crawl into my sleeping-bag. I can still hear Peter muttering English words and phrases. But he, too, is being rapidly overcome by sleep and the warmth.

What a pity it is we none of us have a gift for writing poetry! Somebody ought to write a "polar ode" to our sleeping-bags, our paraffin, and our splendid primuses!

But it is a great thing to sleep in a warm bag, with the knowledge that you are living on a cold icefloe. . . .

September 20. Peter and I woke almost simultaneously, and started saying to one another: "Let's get up. . . .!"

To hasten this process Eugene has fixed up a "magnet": a bar of chocolate hung over Peter's head! Whoever wakes Peter immediately starts the stop-watch. If within five minutes Peter's feet have not touched the floor, Peter loses the chocolate. On this occasion Peter got up quickly as he has a lot of work to do to-day.

In the morning Eugene froze some wooden shelves into the walls of the ice laboratory and fixed up several ice stands for additional instruments. He spent all day in the observatory, making his intricate and varied equipment ship-shape. Anything he had no immediate use for he gave to me to keep in the storehouse.

I also shifted equipment into the storehouse, emptying the sledges: they must always be kept empty—in case of ice pressure.

We have now settled down like real householders. We have a fine storehouse with a strong roof, and the blizzard can no longer cause us any anxiety as we are well barricaded against it.

Ernst and I have been clearing snow from the tent where we keep the spare parts for the radio station and windmill.

Ernst knocked-off to go and cook dinner; I went to No. 3 dump. That, too, has to be cleared. Three months ago I put down a case of foodstuffs here, which had frozen in so hard that I was unable to get it out without the help of Ernst. The tin chiefly contains sausage.

After Peter had lowered a current-meter into the hole he started distilling water; whenever he has a moment to spare he studies the current-meter readings. More often than not Shirshov retires into his tent over the hole for days at a time.

After dinner Eugene went off to his observatory, and I to No. 2 dump. I took out a case containing clothes and underwear, for we have

all decided to have a wash and change: to-morrow marks the four months' jubilee of our arrival at North Pole Station.

In the evening I heated a kettle of water, shaved, uncovered my neck and bosom to a sort of "modest décolleté," to use Krenkel's words, and washed. Peter poured the water for me. Though the outside temperature registered 20° of frost, the ordeal had to be endured. We made a firm vow to go through with it, in honour of the occasion, despite all the discomfort and hardship inseparable from a wash in severe frost.

Our toilet over, we switched on the loudspeaker and listened to "Latest News." Moscow made reference to us, saying that it was now four months since we had been working on the drifting icefloe and sent us her heartfelt greetings.

Ernst, after washing, changed into new fur overalls. Previously we were all somewhat diffident about wearing these overalls thinking they would be awkward to pull on. However, when we had worn them a few days we began to think better of them and are now quite used to them.

Despite our holiday mood, Peter keeps up his studies on the data of our drift. An hour ago he extracted the current-meter. We allow no interruption in our work: even on "rest days" we carry out our various duties.

"Our icefloe is now being driven in a south-westerly direction," reported Peter.

September 21. To-day we all got up together, wishing to celebrate our holiday somehow or other; but how? Shall we have a special dinner? And what shall we do till dinner-time? We sat silent for a few moments, and then decided to proceed with our everyday work; it is boring on the floe with nothing to do.

Eugene is making a new apparatus—to register the force of shocks on our icefloe, even of the slightest. We shall thus be opening something like a branch seismographic observatory. Eugene Konstantinovich will be the head and only member of the staff.

In the morning I visited the storehouse and made partitions out of old cases for our suspended "sideboard." We are in need of a sideboard out here, but we did not want to take any extra cargo. Our food, mugs and bread lie on the furskins, and we often find deer-hairs mixed with the butter. I am going to hang up the "sideboard" and put everything away on the shelves. I am also thinking of making a small cupboard for the books, which also lie about the floor, and under the bunks.

We listened to Mikhail Vodopyanov's broadcast. He said that questions were being asked about us in all towns throughout the country.

In view of the holiday, Peter sacrificed 150 grammes of the alcohol which he had obtained from brandy, and which, by the way, he is very short of.

At dinner we drank a toast to our beloved Comrade Stalin, who inspires our people to great victories. A portrait of him hangs in our tent.

We wished one another a successful completion of the drift. We are sure of it; our hearts are filled with resolution and we see clearly ahead.

We are all in festive mood; we feel glad now that we shaved, washed and changed our clothes.

After dinner we rested for an hour, or rather mused over our life. On previous occasions, too, we have lain in our sleeping-bags, silent, seemingly engrossed in thoughts of our families, friends, old times. . . . Later we would discover that we were all thinking of one and the same thing: our life on the icefloe, of the past and still more of the future.

Krenkel transmitted the weather report to Rudolf Island, and then lay down to sleep. I, too, decided to get some sleep.

Eugene went off to his observatory, while Peter proceeded to distil water.

Our camp is now enveloped in fog which presses down on us. If the weather had been clear we could have gone for a ski run or as they say on the mainland, gone out for a "sporting run." As it is we dare not venture out for more than a few yards. Through the breaks in the clouds the face of the moon appears but rarely.

"Nothing can imperil our expedition now," I remarked, as I crawled into my sleeping-bag.

"Why?" said Peter, surprised.

I explained:

"We have now spent four months on the floe; we have carried out a large number of scientific observations, the results of which have been transmitted to Moscow. Even if anything should happen to us the results of the expedition will remain with the people."

"While it is true we have spent a considerable time here, there is still much scientific work to be done," objected Eugene.

"Quite right," I replied, "but in the event of disaster we must take every precaution to preserve the results of our observations and scientific work. . . . It is for this that we are out here, far from our homeland and families."

"I wonder what our 'old girls' are up to now?" chimed in Krenkel.

Peter said musingly:

"Just now they'll be strolling along the Moscow streets. . . . It's beginning to rain, and the asphalt roads glisten, reflecting the lights."

"Hallo, hallo!" interrupted Ernst. "We now commence our broadcast of poetic and sentimental imaginings. . . ."

We burst out laughing and pulled our sleeping-bags up to our chins. For a long time thoughts of Moscow drove sleep away; I tossed from side to side, "walking" along the various familiar streets of the Capital.

Before turning in Peter once more sat down to his nightly English lesson: he fell asleep text-book in hand.

September 22. Ernst is in a bad mood to-day; something has upset him. He says yesterday's drop of alcohol has given him a headache. He is lying down reading Pavlenko's book "In the East."

I suggested that he make a lead-in from the radio receiver to the bunks, so that we can lie and listen to music and the news without having to get out of our sleeping-bags. He agreed and was soon crawling all over the tent, laying wires.

Peter and Eugene went off to reconnoitre, and spent seven hours travelling over adjacent floes. They returned late in the evening with the news that we were surrounded on all sides by icefields and that there were no longer any wide gaps between the floes.

The lads are very tired; Eugene turned into his bag, while Peter, as usual, spent an hour at his English lesson.

During the night Peter paid another visit to the hydrological hole; he came back very distressed: apparently his current-meter is out of order, it needs repairing again.

September 23. Ernst is still reading Pavlenko's "In the East." He read it all night; says he likes it very much. I read the book when I was on Rudolf Island.

This morning Eugene started on a 24-hour series of observations of magnetic variations. He will be working for thirty-six hours without a break.

To-day we can see both the sun and the moon quite clearly.

I continued digging up our meat supplies. Unfortunately, all our "rump-steaks" and "pork chops" have had to be sacrificed to Merry and we had looked forward so eagerly to "feasts" on the floe with real restaurant cuisine! Alas! electrical refrigerators seem to be necessary even in the Arctic.

When I showed Merry his future food he wagged his tail for joy. But before I gave it to him I just checked up once more on the state of the pork chops—I was reluctant to discard them; but there cannot be any doubt—they have gone bad even though kept on ice. Merry is well provided for for a long time; he has enough to last him till the end of the drift. He doesn't seem to worry about that part of it, he lives a carefree life, taking it for granted that we will supply all his needs.

After tea Peter fixed up the current-meter and lowered it into the ocean; we are now drifting south-west.

After his current-meter readings Peter titrated his samples. He has been busy on this all day, for he wants to empty the jars as quickly as possible. To-morrow he proposes to establish another hydrological station, and in a couple of days time he will take a sounding of the ocean depth.

Ernst to-day made some coffee and pancakes.

The weather is exceptionally fine. It is very pleasant working outdoors, though the temperature has dropped to 20° of frost.

To-morrow, if the weather stays fine Ernst and I intend to reconnoitre neighbouring floes. We have to keep constant watch on the state of the ice. We ought to hang up the inscription of "Vigilance and still more vigilance!"

September 24. Eugene undertook the camp watch in the night as anyhow he had to be working on his 24-hour series of observations. For the first time Krenkel turned in when we did.

I had intended to go off on an inspection of neighbouring floes, but snow has been falling since early morning, and we cannot go far afield in a blizzard.

Peter spent the day working at his hydrological station. Deep down the Atlantic waters are becoming definitely warmer, a sign of our approach to the Greenland Sea.

Peter complains that the bathometers which we brought with us are not quite up to standard. They often go wrong. I reassured Peter, telling him not to worry, as I would mend them.

It was just as well we did no reconnoitring to-day, as we might have got into difficulties. Even bringing a small case of sausages to the tent was no easy job ; at every step we sank into the snow. We are surrounded by snowdrifts. After a blizzard, the snow nearly always reminds one of sand in a hot desert.

The snowstorm even blots out the twilight, which is very dim now. A south wind is blowing, but there is no hope that it will carry us to the north ; latterly our drift to the south has grown swifter and more clearly defined. At best, this wind may retard our southward movement.

September 25. Ernst always brings us the first news of the day—good or bad. To-day he woke Eugene and said briefly :

"The temperature during the night was 26° of frost, and the gale has abated considerably."

Eugene hurriedly left the tent and standing in the lobby pulled on the felt boots—our communal huge felt boots.

I stayed in my bag for another hour, as I had a headache. For some reason or other my nose bled during the night. On rising I didn't feel like tea, and went straight out to work on the storehouse.

Peter lowered the lead to sea bottom. The depth was 4,025 metres. Then we hauled up the lead.

Although this is by no means the first depth sounding we have taken we have never before found the winch so hard to turn as to-day. This is due to the rapidity of our drift, which presses the cable to the side of the floe.

As usual, we relieved each other every 300 metres. I paired off with Eugene, Ernst paired with Peter. Though the frost grew more intense, we got wet through.

Towards evening we went in for dinner : we had the soup which I had cooked five days ago. It was rather sour, but I added water, and everyone pronounced it good. It tasted of smoke, but we are now used to the taste of smoke.

Usually we take an hour's rest after dinner, and then proceed with our scientific and domestic work.

Eugene made an astronomical determination and then lay down to sleep.

After his rest Peter lowered the bathometers to a depth of 3,000 metres, in order to obtain a complete hydrological station at twenty-four levels : he will be working till morning ; we don't expect him to come in before then.

Before turning in we went out to inspect the camp.

The sun is sinking lower and lower on the horizon, and the moon peeps through with increasing boldness. Yesterday we caught sight of

a star, much to our delight: the stars will enable us to determine our position, for very soon, now, the sun will disappear altogether and the polar night will be with us.

Inside the living-tent the temperature is 12° above zero. We heat our "ice-villa" by means of oil lamps. Later on, it may be colder, but we are not afraid of freezing; we are all hardened to the cold.

September 26. During the night Ernst helped Peter draw up the bathometers from the depths of the ocean. We are getting Ernst on to more and more physical work, for otherwise he may fall ill.

To-day Eugene wrote an article for *Komsomolskaya Pravda*, on a working day at North Pole Station. Ernst and I wrote an article for *Pravda*, which we transmitted.

I have filled all the hurricane lamps, cleaned and tested them. We are making more and more intensive preparations for the polar night. These hurricane lamps will be our future luminaries; we shall have to live four months by their light, until the sun reappears.

I decided to relieve Peter of a few of his jobs, and undertook the distillation of water. I am going to give him a big supply to enable him to titrate his samples.

Eugene computed that to-day we are at N. Lat. 85°33′. When we reported our position to Rudolf Island they laughed and exclaimed:

"Where are you hurrying to?"

Snow has been falling all day: the polar twilight has already set in. We have put away our cameras; we shall not be using them any more till daylight comes. Eugene suggested that we photograph the Aurora Borealis by using a telescopic lens.

September 27. I continue to supply Peter with distilled water. I have a tin filled with chipped ice, to cool the worm. My first attempt was not altogether successful, the water contained an admixture of salt; how it got there I have not the slightest idea, and all my labour was wasted. The next time I was more careful, and Peter approved of my work. I am now distilling a large reserve supply.

Eugene has surrounded himself with notebooks, reference books, tables, charts, and is making some sort of calculations; he is also continuing his examination of the data on gravitation.

I am extending my knowledge of astronomy so as to be able to take our bearings by the moon and the stars by myself. When in Moscow I used to study astronomy, but in those days I lacked the instruments and, still more, the time. However, the theoretical side of it is fairly familiar to me. Eugene assures me that I know enough now to take our bearings on my own.

September 28. When I ordered our main living-tent I gave the Moscow "Caoutchouc" factory quite a lot of trouble. Skilfully cut covers of canvas and tarpaulin were made and fitted on the framework. I made great demands on them: the tent must be strong, warm, easy to assemble and dismantle, and so light that we could carry it about ourselves.

It must be admitted that our "house" is a great success. The summer rains failed to seep through the outer covering, which had been treated

with a special black solution, absorbing the sun's rays, and thus heating the tent. Two quilted down covers act as heat insulators. All the covers are firmly laced, but it only requires three slashes with a knife to free them. The floor, of rubberised canvas on plywood, is covered with soft deerskins, on which we sit or sprawl. In short, our tent is both warm and cosy.

Practically all the space inside the tent is taken up; there are four bunks, the radio station from which cables stretch to the accumulators and commutator, the hydro-chemical laboratory (somewhat like a cupboard, containing innumerable phials tangled up with rubber tubes of various lengths), the meteorological instruments, chronometers, and a convenient sideboard which holds our food and all sorts of essential trifles. One cannot walk about the tent normally. Bending low, one has to crawl carefully through the few uncluttered lanes and crossings, butting into stockings, gloves, and shirts hung up to dry. These acrobatics are the occasions of much laughter.

True, we could have carried on both in an ice hut and in an ordinary tent; but our snug canvas house allows us to rest thoroughly and to husband our strength for our productive work. We don't worry about the overcrowding and having to sit on the floor, and we remember with gratitude all those who designed and made our living-tent, and think with affection of our Soviet Government which has shown so much solicitude and consideration in the equipment of our expedition to the Far North.

And so, we have an excellent dwelling. I mention this in my diary to-day, because the wind is very strong again and beating vainly against the sturdy sides of the tent.

While Peter went off to operate the current-meter I replenished his supplies of distilled water. This time I managed not to spoil any: all the water I distilled proved perfectly suitable for chemical analyses.

When Peter returned he proceeded to titrate his hydrological samples. He has to work up the data of practically two stations and will have to be quick about it, for the speed of the drift has increased.

I am feeling rotten: my head aches, and from time to time I have a fit of shivering. I lay down on the skins for a bit and began an article on the animal kingdom in the Arctic Ocean.

The wind rapidly charged up the accumulators and we were able to test our "searchlight". For the test we lit a six candle-power bulb, which seemed almost dazzling compared to the dim oil-lighting we use normally. But we dare not leave it on for long; we need all the energy in the accumulators to be used exclusively for radio contacts.

Soon I shall be on kitchen duty once more. I have almost forgotten the day since Ernst and I cleaned the saucepans. We are at a loss to know what to do: it must be three weeks since we last washed the dishes, and in all probability they will remain in this unwashed state until the end of our drift. All the saucepans are black, but we have no intention of cleaning them. After making pea-soup in a saucepan we fill it with ice, and try washing it out that way, but without success.

We have to use the same saucepan for making borshch, and the bowl which held cranberry jelly has also to be used for making cocoa. We are in a bad way as regards water, and our efforts to wash the dishes end in their getting dirtier still.

September 29. A blizzard is raging. The only man to leave the tent was Eugene, who went out to record the state of the weather.

Later in the day I, too, went out; the camp was unrecognisable. The floe had become covered with snow ridges and looked like a sea that had frozen at the moment of its greatest swell.

During the past twenty-four hours the drift has been uneven. Somewhere the ice is in a state of stress. Pressure of immense force is taking place somewhere and the ice is piling up into colossal packs. The wind is dying down, and the windmill is motionless, but on the ridges of pack ice a thin snow still hovers like smoke. The surface of the floe is completely transformed. Immense snowdrifts, snow ridges and snow banks surround us. The dumps and the tents are snowed under.

Peter did not go out of the living-tent, but continued his titrations.

In the evening we listened to a concert by Jakob Zak, broadcast from the Big Hall of the Moscow Conservatoire. Reception was good, and we all enjoyed the concert immensely. What a wealth of talent our youth possesses!

"Now that the polar night has set in," said Ernst, "reception will improve on all stations."

The radio operators on Dickson Island read out to us, at my request, an article from the Sevastopol paper, *Mayak Communy*. I have many ties with Sevastopol. There are my countrymen and family; it was there that I passed through the great revolutionary school. I shall always think of that town with the greatest affection.

Later, Rudolf Island asked us for supplementary weather reports, as Mikhail Vodopyanov intends to take off in search of Levanevsky's plane. This decision worries us all very much; the weather in our region is very bad, for three days now visibility has been nil; who can guarantee that the weather in the region Vodopyanov intends to search is any better?

In future we shall have to stop drawing water from the lakes and the hole; it is salt and bitter, and tea brewed with it tastes most unpleasant.

To-day Eugene took our bearings by the moon and Venus.

During the night I left the tent to inspect our equipment. I am particularly pleased with the windmill. We must not fail to take it with us when we are removed from the floe; we must present it to one of the museums. It has been of the greatest assistance to us, and back on the mainland it will be a valuable exhibit to demonstrate the conditions of life at North Pole Station.

September 30. A blizzard is raging on Rudolf Island. Apparently Mikhail Vodopyanov's flight is to be postponed.

The sun sinks lower and lower in the horizon; soon it will leave us altogether till the spring; we can see the stars all the time.

We have introduced a new time-table: two hours have been specially allocated for political classes. So far, however, we are still too busy to start the classes.

I am sorry that I am so overloaded with work as to have no time for hunting. In addition to providing us with fresh meat, the sport would also have had some scientific value.

World science owes to Fridtjof Nansen its main knowledge, meagre though it is, of life in the central region of the Polar Basin. Accepting Nansen as their authority, many scientists have maintained that no life existed in the Arctic Ocean, particularly in the central region.

Our drift from the North Pole to the 85th parallel has covered regions supposed to be barren and devoid of life. Yet we four Soviet polar explorers are the first witnesses of the most interesting phenomena.

Shortly after our arrival at the North Pole we could hardly believe our own ears when we heard the chirping of birds. Then we saw a snow bunting. One of the first inhabitants of the Pole tentatively put forward the suggestion that this bird might have been brought on one of the planes! Later, however, we were visited by seagulls, fulmars, guillemots and many other birds.

When Peter establishes his hydrobiological stations at various latitudes and sea-levels he invariably draws up a rich haul of medusae and all kinds of crustacea. Furthermore, as I have already mentioned, in an open polynia we spotted a sea-hare and a seal, who both feed on these tiny creatures. We wished we could have got a shot of the sea-hare with our cine-camera, but he was very cautious. One day I actually shot a seal, but unfortunately the force of the drift drew it under the ice. And finally there is that menace to all Arctic animals, the polar bear, three of whom visited us one day.

I have not the slightest doubt that if I took up hunting seriously we would always have fresh meat for the table. I keep on postponing it. I really must engage in this pleasant and useful sport.

During the day I made a round of the camp, where there is always urgent work to be done after a blizzard. First of all I dug out all the gear—as usual, everything was snowed under.

We shifted the meteorological tent close to the living-tent, for as it is getting dark now with the coming of the polar night, it would be easy to lose one's way. Ernst has promised to wire the tent so that we can have an electric light burning in it.

Peter cleared the hole and prepared the winch for a depth sounding.

Towards evening I felt ill again. I took my temperature—it was above normal. Peter gave me a couple of aspirins.

"You need to sweat it out," he said.

Somehow I have very little confidence in Peter's medical ability. As for surgery—that is completely out of the question, even though Peter has collected a great many scalpels and needles. Before flying out to the Pole he took a course of special training under surgeons in one of the Leningrad hospitals: lancing boils and festers on fingers, dissecting, etc. Sometimes, he bought 2 or 3 kilograms of beef and practised cutting

it up and stitching it together again. But beef is not a human being. . . . No, I would rather not be a surgical case under Peter ! If one of us falls seriously ill he will have to wait for treatment till he gets back to Moscow, rather than allow Peter to test his skill on him here.

To-day is the sixteenth anniversary of my married life with Volodichka. Her sister Zina sent me a radiogram : "Dear Dmitrich, I congratulate you and wish you and Volodichka continued happiness in your life together."

I have sent a radiogram of congratulations to Volodichka.

OCTOBER

October 1. The doctor did me good : my temperature is normal to-day and I feel my old self again. I am beginning to entertain a certain respect for Peter's medical ability. I went out and made an inspection of our airfield, which the recent blizzard has improved ; the snow has levelled all the hummocks and filled up the holes. A few ridges I cleared up myself. We must keep the airfield in constant readiness.

On my return from the airfield I made some tea. Eugene in the meantime had transmitted the weather report to Rudolf Island. This is the second day he has done this on his own ; Ernst has taught him how to do it. Day by day we learn new specialities from each other, and this is very important for workers in polar regions.

At midday, as the weather was good, Eugene and Peter went on a tour of inspection of the adjacent floes.

I stayed behind on camp watch. I lowered the current-meter to a depth of 300 metres to determine the speed of our drift. After that I pottered around with the lamps and prepared the fuel mixture for the primuses.

Ernst woke up (he had been resting after his night watch) and immediately proceeded to contact Rudolf Island on the radio. They transmitted a radiogram informing us that our wives were to go on the air in the Arctic edition of "Latest Radio News." I was rather surprised —how could Volodichka take part in this broadcast, when she was out of Moscow ? However, they had communicated with her by telephone and she spoke to me over the radio from Kislovodsk. She told me that she was leaving shortly for Moscow, and wished the lads and myself the best of health and success.

Ernst's wife and Peter's wife and mother also spoke. But Peter was out on a distant reconnaissance trip at the time. On his return he was very upset to have missed hearing his wife's voice. We consoled him, telling him there were sure to be other occasions.

I took over the duties of cook : my turn has now arrived for kitchen duty. Dinner was later than ever to-day. I made some cocoa, but no one wanted it, not even our scouts, as we call Eugene and Peter. They toured the whole region, making a ski trip of over 40 kilometres.

The sky is clear and bright. A few stars have already appeared.

Eugene made an astronomical determination, but hadn't time enough to work up the data.

The frost has reached 28°.

It is getting on for 3 a.m. I feel a bit tired; not in the mood for diary writing. I am going straight to bed.

October 2. Peter and I woke simultaneously, and drank tea together. Later we were joined by Eugene. He always manages to have tea twice —once with Ernst and once with us. When I chaffed him about it he replied:

"Well, Dmitrich, I love tea for two reasons: it warms you and keeps your nerves steady, which is not at all a bad thing in our circumstances."

Ernst calls Eugene the "tea-swiller."

Peter went out and lowered the current-meter while I fixed up a bucket for melting ice: we shall use this bucket to prepare water for the next day.

It was not long before Peter returned and proceeded to titrate the samples of his hydrological station.

Eugene announced our new bearings to be 85°28′ N. Lat., 3°58′ W. Long.

Eugene has been working three days on the data of his observations on magnetism. He only breaks off when the routine weather report has to be transmitted to Rudolf Island. He is now doing well as radio operator, though he is rather slow. It seems that operator Stromilov, on Rudolf Island, who takes Eugene's transmissions, curses him a bit for his slowness, but there is no great harm in that; the important thing is that in addition to Ernst we now have another polar worker who can operate the radio, though he is not very expert. When Eugene takes the "radio watch" he is visibly nervous, particularly when he is receiving radiograms. He does not sit on an empty upturned case as Ernst does, but kneels before the instrument, his body and head bent forward like a bird pecking food; each dot and dash he taps out distinctly, but with excessive intensity.

Peter is not himself to-day; he is still upset at having missed his wife's voice yesterday. We can understand how he feels.

I cooked the dinner and we all ate heartily. One main course was a left-over from yesterday, but for the second course I made a milk pudding.

I get some practice in playing chess with Ernst. Before he taught me I couldn't play at all, but am making tolerable progress.

I am firmly resolved to start a class on the history of the Bolshevik Party on October 15. I shall have to give the first lecture.

After dinner Eugene and Peter continued to work up the data of their observations; when I had a free hour I made some flapjacks for our evening tea.

The weather is vile, with a fierce ground-wind blowing; nevertheless, I had to go out and chip some ice to get water for the kitchen. Besides, Peter needs some more distilled water for his hydro-chemical analyses.

The days are growing shorter and shorter; we are gradually entering on the long polar night.

We are getting ready to turn in. Ernst alone will stay up. He squats at the tent entrance, hardly able to keep his eyes open. To keep himself from dozing off, Ernst puts on his earphones and starts his usual "hunting" for radio amateurs. At night, too, he likes to "sound the air", and in the morning he tells us the most varied news from all over the world. We call him our "living newspaper."

During their ski trip yesterday, Peter and Eugene discovered that adjoining our icefield to the south was a similar powerful field some 6 kilometres in diameter. Farther on began a region of considerable clearings covered with newly formed ice.

The continued strong southerly wind at first stopped the drift of our floe, but later the icefield was carried in a north-easterly direction.

It would be interesting to know where our floe will be at the end of the month.

October 3. This morning Ernst made the tea; he handed me a mug and then woke Eugene, who was most reluctant to get up; Ernst had to drag him out of his sleeping-bag.

We were all very late turning in last night, particularly Peter, who after finishing his scientific work usually spends a long time studying English.

Before we got out of our bags we started talking about Moscow, our home affairs and life during the polar night. This sort of talk is naturally stimulating, and banishes all desire for sleep. We got up and made some tea.

Peter went off to lower the current-meter. The drift is carrying us at a speed of roughly 700 metres an hour. "A wicked drift," says Ernst.

Eugene is working on the data of his observations on gravitation and magnetic variations. He tells us he will have completed this job by to-morrow.

Towards evening we went out to look at a very big polynia formed as a result of the south wind at the northern boundary of our icefield about 1 kilometre away. There was a clear space between the icefields of about 300 to 400 metres.

The polynia stretched for several kilometres, disappearing into the darkness. Waves were whipped up on the polynia by the wind. So our icefloe is gradually diminishing.

Some stars peeped out and Eugene made an astronomical determination (he has fixed up an electric light near his theodolite); I gave him a hand.

The wind whipped up the snow so much that we left no footprints. Once again the dumps were snowed under, which meant another clearing job for us.

The usual north-west wind has again driven our floe south-east.

We all agree that we must arrange our life more rationally; get more sleep and rest. We go to bed very late, and rise too early. We have made a resolve to look after one another and observe a normal regime.

In two days' time the sun will set completely in our latitude and the long polar night will begin.

It is nearly 1 a.m. Eugene is fixing up the theodolite in a new place, Peter is reading something in English, while I am completing to-day's entry in my diary.

October 4. The drift has slowed down a bit.

This morning Eugene put up a lead in the meteorological tent and connected the living-tent with his observatory by microphone. Now we are completely "radiofied." Eugene can observe the stars, while one of us can record the result in the living-tent, where the chronometers are kept, this will make Eugene's work much easier. In severe frosts it is difficult to carry out astronomical observations and record them by the hour. Also, our big mittens impede us, and without them one's hands are numbed in a few minutes.

In the evening we carried out astronomical observations in accordance with our new arrangements. I was with Eugene at the theodolite (I work with him all the time, for I shortly intend to carry out astronomical observations on my own), while Ernst in the tent recorded the data. Our position is 85°19′ N. Lat., 7° W. Long.

Towards evening I visited No. 1 dump and dug out our gear and put everything in order.

I was wet and tired when I got back to the tent. I should have liked to rest, but suddenly remembered that the polynia ought to be inspected without delay; ever since yesterday's examination I have been worried about it, so out I went once more. The weather was fine to-day, although the sharp wind and severe frost were none too agreeable. The sun, however, is still shining for us. After to-day we shall not be seeing it any more this year!

I walked the length of the polynia. It seemed to me to grow hourly; in some places it was already 500 metres wide. I noticed a thin layer of new ice forming on the surface. If the frost becomes more intense another strong icefloe will form, which will make quite a good landing ground for planes.

As Eugene kept his notebooks and all his astronomical instruments piled in a corner of the living-tent on the skins, I decided to make him a present of a special shelf. I got hold of a board, took it into the tent and soon fixed him up with a corner for his astronomical equipment. He quickly made use of it, arranging his notebooks and reference books and chronometers on it.

As the shelf is by the side of my bunk, Eugene has fixed up a string net alongside the bunk. Now when I go to bed I look like an animal in a cage at the zoo.

At dinner to-day the lads complained of the soup, saying it was sour and undrinkable.

Strange—I had diluted it with about two litres of water; I must have put too much citric acid in it. . . . The lads are having a hearty laugh at this failure of mine. For all that, we have settled that I am to do the cooking till the end of the drift. For one thing, Ernst is on watch at night, and if he cooks the dinner during the day he goes short of sleep; so now that I am "chef" I shall have to see that the family is well fed!

By now I have adapted myself to kitchen work. Instead of washing the dishes, I wipe them over with damp wadding. In this way I economised on the fresh water, which is always in short supply: it takes us half a day's work to obtain a bucket of water. Of course, I have to try and wipe over the dishes immediately after dinner, while they are still damp, otherwise within an hour they are already encrusted with ice, which means that hot water has to be used on them.

Ernst and I played a game of chess. I lost, of course, for I am still only a beginner.

Before going to sleep, however, I had my "revenge", and won a bar of chocolate from Ernst. We had a bet; it usually takes us fifteen minutes to start up the windmill; I said I would do it in two minutes, and I did! However, I decided not to deprive Ernst of the chocolate; better to remind him about it when we get back to Moscow.

At the request of the editor of *Pravda* I sent a short article to that newspaper. The *Pravda* people are very interested in us and send us encouraging messages.

October 5. We have been notified that the editors of "Latest Radio News" propose to organise another broadcast by our wives. We are delighted to be given the opportunity of hearing their voices again.

To-day is exceptionally fine and clear with the temperature at 27° of frost. Towards evening the drift slowed down. We are trying to turn in earlier, as a "state of emergency" has been declared for to-morrow—we are going to draw up a sample of the sea-bed.

Before dropping off to sleep we heard a rumble; it must be a shifting of the ice. The pressure was in the vicinity of the polynia, whence came a continuous cracking sound.

During the evening, we had a series of accidents. First the electric bulb on Ernst's radio station burst, and we have only a small supply of them. However, it couldn't he helped! Then a few moments later Peter went to the door, caught against the shock-absorber and knocked down the "bat" hurricane lamp, which also broke. Although we regretted losing the lamp we all made a joke of it.

"Something broken brings good luck."

Still, I would rather not measure our luck with hurricane lamps, as we have very few glasses for them.

We went outside and stood for a long time listening to the crack-cracking of the ice. Merry barked ceaselessly and kept on running off to the fissure, and then back again.

October 6. Eugene has gone off for twenty-four hours to work in his ice observatory.

Peter is preparing to lower the bathometer and scoop in order to obtain a sample of the ocean bed.

I took my rifle and went off to the polynia. I was very worried about the ice pressure of last night and wondered what might have happened.

All around was a mass of broken ice. The wind appears to have taken a hand here with a vengeance. The pressure had affected our floe. I noticed fissures in several places; towering pack-ice and hummocks had

formed along the fringe of the floe. It was newly formed ice which the pressure had thrown up on our icefield.

When I returned to camp Peter informed me he had lowered the lead to a depth of 3,500 metres, when the cable snapped, leaving the hydrological "equipment"—two bathometers and a scoop—at the bottom of the Arctic Ocean.

In puzzling out how it could have happened we came to the conclusion that the lead must have struck the bottom with great force, and that twists had formed in the cable, which broke when an attempt was made to draw the lead out of the silt.

Our work on the deep-water station, as always, progressed rapidly. We paired off to haul out the cable with the winch. Eugene and I worked together, Ernst worked with Peter.

Then I set off to cook the dinner, for we were all famished.

Peter says this has been a day of misfortunes, but we all try to comfort him.

There are three of us on camp watch to-night. Eugene is working on the data of a series of magnetic variations; Peter is putting his notes in order, and Ernst is awake as usual.

October 7. Apparently snow is a very good insulator. There was a big draught in our tent, so I flung masses of snow onto the roof, and at once the tent grew warmer and the draught stopped.

Peter mended the cable, attached a new bathometer, and lowered it to the bottom of the ocean.

In the meantime news came over that Vodopyanov had taken off from Rudolf Island for the region of the Pole, to search for Levanevsky's plane.

Ernst refused to rest after his watch, and remained at his radio receiver.

It transpired the flight was exceptionally good, though it was undertaken in very difficult weather conditions. Vodopyanov flew to the Pole and examined a large area but, unfortunately, could find no trace of the missing plane, so headed back to Rudolf Island. He dropped a number of flares during his flight.

To-day we again talked and talked about what could have happened to Levanevsky's plane. Had it been an instantaneous disaster in which the radio operator was unable to send over the air even two words "Forced landing"? Will we ever get any news of our airmen friends?

Peter and I went off to the hole to haul up the cable.

When Ernst heard that Vodopyanov had landed safely on Rudolf Island, he removed his earphones and prepared to turn in. But first Ernst and Eugene decided to have breakfast.

We have an empty food tin suspended over the hurricane lamps, to protect the tent from catching fire. Ernst had placed a slice of sausage on top of the tin—to warm it up. For several days now Ernst and Eugene have sausage for breakfast. Peter and I are loath to join them for "tin-warmed sausage" does not inspire us with confidence.

I spent a long time working the winch, and came back tired and wet so I decided to rest in the warmth rather than go out again and run the risk of catching cold.

Not wanting to waste time, I started to dismantle the current-meter which had been brought into the tent for repairs. I laid out the tools on the bunk—the various bits and pieces, metal parts, screws, nuts and bolts—but had to stop for it was time to cook the dinner. To tell the truth, I am not too keen on this job. Also, the ice kitchen is cold; the knife burns my fingers as if it were red hot; we cannot have water except by melting down ice. However, I know that the preparation of nourishing and appetising food is essential for the successful work of our drifting station, so off I went to my "routine post." . . .

Eugene determined our position to be 85°04′ N. Lat., 4° W. Long.

I did catch cold to-day, after all, so Peter said he would rub my back with turpentine. Being the doctor his hands ought to be scrupulously clean. But he has only just returned from working the winch and when I took a look at his hands I saw they were black with machine-oil. Peter proceeded to rub my back with turpentine and the dirt from his hands was rapidly transferred to me. . . .

Peter even had the nerve to make a joke of it.

"The best way to get the grease off my hands is to rub your back a bit more often. . . ."

It was a pity I was unable to have a look at my back in a mirror. I must have had stripes like a zebra!

I crawled into my bag, wrapped myself up as warmly as possible and fell asleep. It was not till the following morning that I completed my diary entries.

October 8. We are the northernmost inhabitants in the world. From our position at the 85th parallel, we follow eagerly the political life of our Motherland. Tremendous events are now taking place at home. All over the country our people are preparing for the elections to the Supreme Soviet of the U.S.S.R.

We hear over the radio how the great Stalin Constitution is being put into practice. Though we are so far from the Motherland we also intend to take part in the elections. But the problem remains how to put this into practice.

Difficulties are always cropping up in our life out here. Just now for instance, it transpires that we are short of sugar; this is probably our most vulnerable spot; we are using rather more than the scheduled ration. True, we have a small reserve supply, but I am holding on to that, for we shall be drinking more tea during the very severe frosts, which is just the time when this reserve will come in handy.

Ernst has taken down and transmitted to its destination the pre-October Anniversary radio relay, organised by the journal *Radio Front*. The relay, dispatched from Moscow, runs through the Ukraine, Transcaucasus, Uzbekistan, Tartaria, the Urals, Siberia, the Far Eastern frontier districts of the Soviet Union, the littoral of the Arctic Ocean, our North Pole Station and Leningrad. Quite a distance!

Peter has cleared the hole; he spent all day banging away at it with a long rod, knocking out the newly-formed ice. Then he proceeded to establish a hydrological station. It is very difficult working in such

severe frost—a primus has to be kept constantly alight to heat water; Peter pours hot water on the bathometer each time before lowering it.

The floe has been trembling all day to-day, and Eugene's instruments are affected by these tremors; the series of gravitational observations has been spoiled and will have to be made all over again.

I did some work at the storehouse, and opened a case containing glass chimneys and wicks.

After dinner Eugene taught me to use the theodolite, so that I could take our bearings astronomically if the need arose.

In the evening we assembled in the tent. This has been rather a rare event lately, for there is nearly always somebody either working outside or asleep. It is warm and cosy in the tent, though rather crowded when we are all in it at the same time. But we are so used to it that we don't notice it. It reminds me of the saying "It may be crowded but no one takes offence."

Sometimes, when the lamps are burning, there is insufficient oxygen in the tent, but one gets used even to that.

I am pleased beyond words at the conscientious attitude of our young scientists towards their work. This is particularly gratifying to me, as head of the expedition. Both Peter and Eugene are meticulous in the execution of their duties. All their scientific observations will be of a very high standard. I hesitate to say which of the two works most zealously.

We spent all the evening talking of our future plans and activities on the floe. We are all in excellent spirits and bubbling over with the desire to work and create.

October 9. For breakfast to-day we had rusks with butter and tea with milk.

Peter wrote a short article about the scientific work accomplished in the past month.

When he had finished the article Peter went on with his English studies.

We try to transmit the results of our work to Moscow as often as possible; our scientific observations do not belong to us alone, but to the entire Soviet people. We have often discussed the possibility of something happening to us. If we should perish, the results of our scientific work would remain. Everything we observe here will be new to mankind.

Rudolf Island informs me that Soviet weather forecasters on the basis of our observations are reviewing the earlier theories of anti-cyclones in the Central Polar Basin. This is of considerable interest to the science of meteorology.

October 10. This morning we none of us wanted to crawl out of our warm sleeping-bags, but Ernst had already cooked a hot breakfast and he hurried us out.

After breakfast Eugene went off to make a series of gravitational observations.

Peter studied the data of the hydrological station which he established two days ago. I keep urging the lads to work up their data as quickly as

possible; the sooner the results of the scientific work are received in Moscow, the better. Peter and Eugene are fully aware of this, and are not inclined to delay the work.

Ernst is swearing to himself; he is still unable to make proper contact with the Barentsburg radio station. The radio operator there is not very expert at his job and as our drift takes us farther south, the importance of contact with Spitsbergen will increase proportionately.

October 11. We had intended to hold our class to-day to study the Constitution of the U.S.S.R., but in view of the urgent scientific work we have postponed it for two days.

Eugene has fixed up the theodolite at the old spot. He brought it into the tent to warm it. I took advantage of this to make a careful examination of the instrument with him.

It will soon be five months since the beginning of our drift. The farther south we drift, the swifter the speed at which we travel. Nearer the North Pole it took us a month to cover 1° of latitude. Now our rate of progress has changed; already we are leaving the 85th parallel. Along a straight line the floe has drifted about 300 miles from the Pole; actually the distance covered is somewhat greater.

We have learned quite a lot about our frosts: if the sky is overcast the temperature is 15–17° below zero; if clear, it is 25–27° below.

Working conditions have now become much more difficult, particularly for Peter; in July it took him twelve hours to establish a complete station, now it takes him twenty-six hours.

The weather is vile to-day; a strong wind and raging blizzard.

I have caught a bad cold. I think the long spells in the ice kitchen are to blame. Peter is again getting ready to rub my back with turpentine. I look with horror at his grimy hands as I stetched myself out on the deerskins; it might be an operating table!

The Atlantic Ocean is more and more revealing its secrets. Formerly the temperature of the water at a depth of 300 metres was 75 hundredths of a degree above zero, now it has risen to 1° above zero.

October 12. Each time I go into the kitchen to melt ice I think of the summer; we had plenty of fresh water then, and were very upset by the streams and rivers; we had to take severe measures to deal with the "flooding." Now every cup of water entails much labour. All in all, we have a lot to do; we never work less than fifteen hours a day; when we turn in we sleep like logs.

Eugene has drawn a map and to-morrow he will plot the course of our drift on it.

In the late afternoon we listened to a broadcast of a recording of the speech made by Comrade Stalin at the Extraordinary Eighth All-Union Congress of Soviets.

There was also a broadcast from Moscow on the preparations for the elections to the Supreme Soviet of the U.S.S.R. Judging by the information given in "Latest Radio News," the opening of the election campaign has been greeted in the country with much enthusiasm. Listening to these reports has filled us with the keenest desire to carry out our scientific

work as successfully as possible, and to report to the Party and the Government that we have fulfilled our duty to the country.

The wind continues to blow hard and the frost grows more intense. We have become so accustomed to the frost that we hardly notice it.

We are all going to turn in now; Ernst will remain on camp watch.

Ernst spends much of his time alone keeping guard over the ether. Every now and again he takes off his earphones and leaves the tent, to listen to the noises of the night. He is passionately devoted to his work. There has been no occasion when radio contact with the world was broken through any fault of his. Thanks to Ernst we are constantly in touch with all current events, and out here—on the drifting floe—we are able to keep abreast with the vigorous political life of our country.

October 13. Eugene has surrounded himself in the tent with his maps, reference books and notebooks. He is plotting the drift of our floe. As there is not enough room on his bunk, he has spread some of his material on empty tins, some on the skins.

And so we are drifting south of the 85th parallel. This fully confirms our conjectures that after five months we should find ourselves 5° south of the point where we landed—the North Pole.

In the morning Peter mended his fur shirt, which was torn in several places. He is not a very good tailor; as he dug the needle in and out he sighed pitifully, as if deploring his bitter lot.

When Peter had finished his sewing he cleaned the bathometers. At midday he strapped on his skis and went off to take a look at the newly formed ice at the fissure.

Hydrological investigations have shown that the layer of Atlantic water has increased in thickness by nearly 100 metres. At a depth of 400 metres the temperature of the water has risen to 1.02° above zero. This signifies our approach to the Atlantic Ocean.

My admiration for the industry and self-sacrifice of Peter and Eugene grows steadily. It is hard on Peter, having to spend hours at the winch; the metal parts of the instruments freeze quickly and his wet fingers stick to them.

I am having to do all my work in the kitchen by lamp-light. It is beginning to tell on my eyes and I have to go out of doors more and more frequently.

Eugene took our bearing by the stars. Our position is 84°46′ N. Lat., 6° W. Long. The floe has drifted 10 miles in two days.

We are drifting rather rapidly. During September, on a straight line, the floe covered 80 miles at an average speed of 2.7 miles a day. Some of the deviations from the general course were insignificant and the drift northwards was hardly noticeable.

The summary compiled by Eugene shows that the outside temperature in September fell gradually from 7° to 8° below zero, at the beginning of the month, and from 17° to 18° below zero at the end of the month. The average temperature during the month was 12.2° below zero; the highest temperature 2.6° below; the lowest temperature 28.3° below zero. A

fact of interest is that the temperature varies as much as 10° in twenty-four hours.

We transmitted to Moscow a summary of these observations.

October 14. My head aches; I must have caught a worse cold. To-day there are 32° of frost. This—in October! What will it be like later? I took a couple of phenacetin powders and crawled into my sleeping-bag. Peter advises me to get thoroughly warmed up. "It'll help you," he says.

Eugene transmitted the weather report to Rudolf Island all by himself. They told him that there were some radiograms waiting for us, and as Eugene is poor at reception, he woke up Ernst.

Ernst sleeps in three shifts, an hour or two per shift, as he has to get up frequently to operate the radio station.

We have informed Moscow that the temperature here is 32° below zero. They probably won't believe us! . . .

After dinner Eugene and Peter went off to inspect the ice. They took an easterly course. They soon came back with the news that the ice was shifting.

To-day we completed the transmission to Moscow of the data of our scientific observations during September. Considerable fluctuations were observed in the ocean depth; over a distance of 37 miles it declined from 4,293 metres to 3,767 metres; for the following 25 miles it increased to 4,025 metres. The latest sounding made on October 6, showed the depth of the ocean to be only 3,500 metres.

October 15. I resumed work on the box for the current-meter, but this time in the living-tent where I took the necessary tools. I would have finished the job long ago if I had not had to do everything by hand. In hurrying over the work I damaged my thumb with the file and now it is so painful I cannot bear to touch it. Ernst helped me when I had to drill the holes.

Peter examined my thumb carefully, and stated that I must keep indoors. Rather a strange prescription for this injury! However, towards evening I felt better, so I went out with Eugene to make an astronomical determination.

Again our view is confirmed that as we go farther south our floe drifts with ever increasing speed.

Peter checked up on the state of the hydrological winch and cleared the hole, which was covered with a fairly thick layer of ice.

October 16. Gale velocity reached 18 metres a second during the night. It is risky to go out as the blizzard knocks you off your feet. Merry has hidden himself in a corner of the tent, howling ceaselessly; it is most depressing.

We are drifting at such great speed that we cannot even establish the routine hydrological station. The cable and bathometer are continually being dragged under the ice. It cannot be helped; we are not on a ship where we can ask the captain to stop. The depth sounding will have to be taken when the wind dies down a bit.

Before turning in I decided to clean my teeth, as I have a nasty

taste in my mouth. However, in the dark instead of using the tooth powder, I used soap powder. For a long time I puzzled as to why my mouth tasted even nastier. Then the idea occurred to me that perhaps the water was bad, so I used snow instead—at least I thought it was snow—only when I began chewing it I realised the mistake I had made; afterwards I spent a good quarter of an hour spitting it out. . . .

October 17. The wind continued to rage all night: our tent shook wildly.

Ernst was on camp watch. He could not even transmit the weather reports, as the heavy snowfall had interrupted radio contact with Rudolf Island.

Usually on these occasions Ernst exercises the greatest vigilance and caution; he is afraid of burning-out the apparatus of the radio station. I suggested that he should go to sleep until the morning, but he refused.

On Rudolf Island, as we learned later, they had begun to be anxious about us: our station had missed two regular transmissions.

In the early evening Ernst managed to transmit the weather report, much to the relief of our comrades on Rudolf Island.

Afterwards we held a class of the Current Events circle. Our subject was Stalin's speech to the Extraordinary Eighth All-Union Congress of Soviets. We were all four present at the class.

Eugene went outside and saw some stars in the sky, so we interrupted the class, and went out to take our bearings. We ascertained that in two days we had been carried 3° westwards.

When we emerged from our tent the camp was unrecognisable: the blizzard had whipped up huge snowdrifts; an immense snow bank had formed between the kitchen and Eugene's ice observatory; the sledges were overturned and snowed under. We could only see one dump distinctly, the others were all hidden under the snow. There were also huge snow drifts at the entrances to the dumps. Briefly, the blizzard has brought us a packet of trouble; all our gear will have to be dug up again (how many times have we had to do this?).

The polar night has set in.

October 18. Eugene fixed up the magnetic theodolite in readiness for his routine observations. Before this he had spent a long time clearing the snow from his laboratory.

To-day I carried out prolonged and persistent excavations. I found the canoe and clipper-boats, and spent a lot of time searching for the case of lamp chimneys. On the spot where it had been placed there was now an enormous hummock, which took me three hours to shovel away.

Afterwards Eugene went off to make his 24-hour series of observations on magnetic variations. Once again he has shut himself up in his snow hut for thirty-six hours.

The wind is abating, but during the day, we managed to get the accumulators charged up properly.

Now the moon has appeared—large and brilliant. Visibility is excellent.

I am feeling anxious, as I have had no radiogram from home for a long time. I went out for a walk to distract my mind a bit.

Later Eugene and I again took our bearings by the stars. My companion was in particularly good spirits, even humming softly to himself.

October 19. Eugene has had a sleepless night; he took over the watch and has been conducting a 24-hour series of observations on magnetic variations. He is terribly tired and sleepy, can hardly keep his eyes open, but is bearing up.

Peter proceeded to get the hole ready to establish a 24-hour hydrological station; The hole had become so frozen over that it took Peter from early morning till 5 o'clock in the evening to chip away the ice.

Ernst and I set to work erecting the aerial. We made fast the mast and tied up all the guy-ropes to support it firmly. After this we proceeded to excavate various articles. We dug up eight sledges and a clipper-boat, and piled all the timber together in one place.

The appearance of our "famous" fissure has greatly changed: fresh pack-ice of the most varied shapes and sizes, now towers along its edge.

After standing for a while looking at the fissure, Ernst and I came back to camp. I proceeded to cook the dinner; unfortunately the primus was choked up, so I had to cook by the blow-lamp.

We listened to the Arctic edition of "Latest Radio News."

We were particularly pleased with the report, broadcast at our request, of what had been accomplished during the last few months in the reconstruction of our beloved Moscow. It was grand to hear that the "Metro" trains will soon be running on a new section—Revolution Square to the Kursk Railway Station—and that when they demonstrate on the Anniversary, November 7, the people of Moscow will cross the Moskva River over a beautiful new bridge. Dear comrades, in thought we shall be with you on that day.

The weather to-day is fine: a light breeze and a brilliant moon; the whole of our floe is clearly visible.

Once again we have received many radiograms from Moscow newspapers asking us to send articles for the holiday issues.

I am still worried at not having heard from my family for so long. What can have happened? Volodichka has been with me at polar stations (on Franz Josef Land and Cape Chelyuskin) and she knows quite well what news from home means to anyone wintering in the North. I wonder if anything is wrong?

To-morrow we start to haul up from the sea bottom the cable which Peter has lowered.

October 20. Peter works assiduously at the winch. Its brake suddenly became capricious. He took a long time to fix it; the belt had to be washed with benzine. The drum, too, was working badly. But when Peter wiped it dry and rubbed an oily rag over the mechanism, the brake functioned perfectly. The lead touched bottom. The depth of the ocean was 3,680 metres.

We did not draw up a sample of the sea-bed, but there were traces of silt left on the plumb, so Peter got another sample after all.

He was in a great hurry to complete the sounding, as the speed of our drift has again increased.

Before raising the lead we had tea to fortify ourselves. We hauled up the lead in the usual way, in pairs: Eugene and I, Ernst and Peter. It took three hours of continuous work to haul it up.

Eugene carried out the routine meteorological observations, while Ernst transmitted the report to Rudolf Island.

When we returned to the tent we had half an hour's rest, as we were all tired out and wet through.

Peter flung himself down on his bunk. He had had no sleep for thirty-three hours.

Something strange has happened to our windmill. Until now it had worked well, charging up the accumulators perfectly; but to-day, it has suddenly developed a rattling and knocking sound. It happened while Eugene and I were winding up the cable on the winch. When I heard the strange knocking, I ran over to the windmill and stopped it. Ernst and Eugene climbed up the ladder to see what was wrong. I feared the pinion cogs were broken.

I dug away an immense snowdrift from the entrance to the store-house, took out some flour and then proceeded to make flapjacks. To-morrow we have another celebration—five months of life on the icefloe; Hardly had time to turn around when another month is gone. We always celebrate these jubilees in some way; we either make flapjacks or a liqueur from brandy, coffee and sugar.

How quickly these five months of our drift have gone by! But the most difficult time lies ahead: the polar night has set in, and work has increased noticeably; the frost makes it harder than it was before. However, it is not so much the frost, as the blizzards, that worry us. How many weary times after the blizzard have we had to clear the dumps, excavate the sledges and the rest of our gear. It is hard indeed! Ernst tries to help me in the domestic work, but he cannot always spare the time for it as he takes the night watch and after that goes to bed completely worn out.

I have noticed a curious thing: water runs down the steel tubing of my bunk, though the outside temperature is 17° below zero; but when the temperature drops to 30° the "waterfall" stops.

Altogether we are rather spoiled as far as warmth is concerned. As soon as the temperature in the tent drops to 8° or 9° above zero we all complain that it is too cold and turn up the wicks in the lamps, which causes the temperature to rise to 13° or 15°.

Eugene is now preparing to make an astronomical determination. He has been waiting patiently for the stars to appear, but they have been hidden by cloud all the time.

October 21. This morning we had another look at our servant—the windmill. I wonder whether it is the teeth of the small or the big pinion that are broken? It would not be quite so bad if it were the teeth of the small one, as the spare dynamo has a similar pinion and we could replace it.

The important moment had come. We set up the ladder. Ernst climbed up and proceeded to remove the casing in order to examine the

pinions. Finally he got the casing off and shouted down to us: "The pinions are intact!" Immediately we felt an immense weight off our minds.

Although a considerable part of our drift already lies behind us, we would find things very awkward if our windmill were put out of action: we would be compelled to put ourselves on emergency "radio rations," and should not be able to send information to the press, or personal messages. True, we have the hand dynamo, but you cannot turn out much with that.

The inspection of the windmill failed to reveal anything wrong with it. We oiled the machinery and started it up about a dozen times, but still could not find the cause of the knocking. We decided when the wind abates to remove the vanes of the windmill and regulate them. The knocking might be due to faulty regulation.

I have begun an article for the foreign press.

The wind shows no signs of abating; the tent shakes continuously, and the anemograph which we put up is also rattling.

At dinner we celebrated our five months' stay on the floe; drank a tot of home-made liqueur and wished one another every happiness and continued success in our work.

Different organisations in Moscow and other towns are constantly bombarding us with requests, particularly just now before the holidays, to send them our "views"—and as these "views" are on such a variety of subjects we seldom answer them all, for Ernst would have to be working without a break day and night to transmit them. No doubt those who receive no reply are offended, but we cannot help that, we have no other alternative.

To-day we received a request from *Literaturnaya Gazeta*, to tell them who was our favourite author and why; what we were now reading; what were our hopes for Soviet literature. Surely they don't think we can give an exhaustive reply to these questions in twenty or thirty words? And what is the sense of fobbing them off with a few general and meaningless phrases?

A star has appeared in the sky. Eugene took our bearings. In eighteen hours we have been carried 8 miles southwards. Our position is N. Lat. 84°22'.

Peter is going to establish his twenty-first hydrological station, and to make his tenth depth sounding.

We resolved to shave and wash our heads: we try to do this at least once a month. Ernst, however did not shave to-day—he was asleep. I boiled up two kettles of water and we shaved and washed, and then made tea. Then we woke Ernst, and while the four of us drank our tea we listened to the night edition of "Latest Radio News."

At midnight we received a radiogram from the editors of *Pravda*, asking us to write a detailed article on our work and life on the floe. We shall do this with the greatest of pleasure.

The twilight of the day grows steadily shorter, and the darkness of the night denser. It is now 1 a.m. The moon sheds a brilliant light

over our expanse of ice, with its peaked ridges of pack-ice. The wind has died down. But we have lost the sun now for a considerable time—till February.

I am feeling more cheerful: I have had a radiogram from Volodichka. Everything at home is all right, and she is well. In my reply I scolded her a bit for her long silence.

October 22. Eugene is carrying out a complete series of gravitational observations. First of all he checked his chronometers with the signals of the Moscow radio station and the French station at Bordeaux. We worked till 7 p.m. without a break and were frozen as the temperature to-day is 23° below zero. The velocity of the wind is 6 metres per second. The temperature in Eugene's ice observatory is the same as outdoors.

Ernst, like a good trapper or fisherman, spent the night "catching" radio amateurs on the air.

First he contacted an Englishman, then an American at a fur-trading station in Hudson Bay.

Ernst resumed his conversation with the American after his morning tea, and it was 2 p.m. before he lay down to sleep.

We started up the windmill, which works quite well now.

I finished the article for the foreign press. It has turned out to be a long one—1,200 words.

The latest astronomical determination shows that we have been carried 4 more miles southwards; we are now at N. Lat. 84°18′.

There are not many minutes left in this degree, hardly enough to last us till November 1; then we shall be in the 83rd parallel.

During the day I paid a visit to the dumps; they are snowed up again. A big iceberg has appeared at the edge of the fissure, towering against the sky like a mountain.

I have long been wondering what I shall do when we return to Moscow. As soon as we arrive we shall all make reports; after that I intend to write a book about our work. Then I will take a rest, and afterwards start negotiations to organise a special expedition to the "pole of inaccessibility" over which Chkalov and Gromov flew recently. Such an expedition would require a powerful icebreaker and several reconnaissance planes equipped with a complete set of aeronautical instruments. An expedition to the "pole of inaccessibility" would give us a still wider knowledge of the Central Polar Basin.

October 23. To-day I spent a long time at the dumps. I tried to remove the butter as far back as possible; if a bear were to pay us a visit he would certainly scent the butter, and that polar resident would think nothing of eating a slab weighing 24 kilograms, thereby drastically reducing our rations. I carried all the butter to the ice storehouse. Though the outside temperature was 23° below zero, I worked without my fur shirt, or I should have sweated even more than I did.

In the past twenty-four hours the drift has carried our floe another 3 miles southwards. Greenland with her mighty glaciers draws ever nearer. We are made aware of this, among other things, by the lower temperature in the region of our drift.

Peter has completed the titration of the samples of all the stations.

A clear moon illuminates our floe: the wires of the aerial hum just like the telegraph wires on the mainland.

Ernst and I left the tent and took a walk along the fissure; for a long time we stood silently contemplating our floe . . . It was nearly 4 a.m. Rising in the distance was a bank of ice 3 metres high. What a force there must have been in the wind to throw up such a mass of ice! The time will come when man will be able to harness this powerful force to his own uses.

I must stop now because I am nearly asleep.

October 24. Still another request has come from a Moscow newspaper, this time, from *Kino*, demanding a reply to their former question as to what we expect of the Soviet Cinema. First the question on literature, now on the cinema. . . .

A hair has found its way into the pendulum instrument which Eugene uses for measuring the force of gravity. He had to spend several hours extricating it.

The wind has abated, and all is quiet. Only now and again is heard the cracking of old ice, caused by the frost, and the tinkle of newly formed ice breaking up in the fissure. But we have got used to the noises. Eugene remarked:

"You know, Dmitrich, sometimes I cannot believe that in this silence which envelops our station, the icefloe is drifting rapidly southwards nearly the whole time."

Indeed, if we did not determine our position astronomically it would be hard to believe. . . . We glance frequently at the map of the drift: Greenland is not far away.

We have at last got the windmill properly adjusted. It is now working excellently.

Before going to sleep I mean to read Stalin's "Leninism." I have read it twice already, on the mainland; now I am reading it for the third time.

October 25. A sudden thaw has set in: the outside temperature is only 2° below zero.

This morning we discovered that the ebonite on the block of the windmill, at the point where the wires are joined, has split. As we had no suitable material for mending it I got hold of a broken gramophone record, melted it and pasted this mass around the block. The new material, which we have called "gramophonite," is just as good as ebonite. . . .

"We must write a scientific article about our latest discovery in the field of building materials," joked Peter.

We had a misfortune while we were doing this job—we lost the spring. I spent a long time hunting for it in the snow; ultimately I found it.

At 6 p.m. we felt a violent shock—our floe quaked. But no external signs of the pressure were visible.

October 26. We have reached N. Lat. 84°13'.

This morning I felt rotten: my head ached, and I was feverish, but my temperature was only a little above normal.

At 9 p.m. Peter proceeded to lower the plankton net to a depth of 500 metres. I helped him to haul it up: we drew numerous crustacea and medusae out of the ocean.

Before turning-in we listened, as usual, to the night edition of "Latest Radio News." It gladdens our hearts to learn of the immense enthusiasm with which the entire country is preparing for the elections to the Supreme Soviet of the U.S.S.R. Everywhere the people nominate our beloved Comrade Stalin as their first deputy. For this man all the people are ready to give not only their votes but also their lives. Stalin has devoted the whole of his life to secure a happy life for the workers.

Out here, on the floe, we are carrying out responsible work entrusted to us by Comrade Stalin, leader of our Bolshevik Party and the Soviet Government. Although we are living on an icefloe, which is very like sitting on a barrel of gunpowder—for at any moment ice-pressure may occur, the floe split or capsize and drag us down with it—we are not afraid to lose our lives, for we have already done much of our work and our labours will not have been in vain. What we have accomplished here is already known in Moscow.

Peter is again working all through the night. The drift is practically at a standstill, and he is making use of this favourable opportunity to make a depth sounding. By morning the lead will have touched bottom, then we shall all set to work to haul it up.

October 27. Peter woke me this morning with the announcement:

"The depth of the ocean beneath us is 3,257 metres."

Then he gave me an anxious look and said:

"You look very haggard."

My head ached so terribly that I didn't know what to do with myself. Once again I had to take a pyramidon powder and stay in my bunk.

I felt a bit better towards evening. I finished reading Theodore Dreiser's "An American Tragedy."

It was announced in "Latest Radio News" that a model of our living-tent is very popular with visitors to the International Exhibition in Paris.

To-day is like a summer's day, with a light wind; water is again pouring down the sides of the tent. We are all keen for the wind to blow harder, as there are numerous radiograms of congratulation for us on Rudolf Island, and our accumulators are scarcely breathing. Ernst is fearful of exchanging a single unessential word with the radio operators on Rudolf Island; what energy remains he is saving for the transmission of weather reports.

A misfortune has befallen us; Eugene has caught a cold. Peter armed himself with his stethoscope and proceeded to sound Eugene's chest to discover whether there are any symptoms of pleurisy or inflammation of the lungs. He was so long sounding him that I got bored with looking on: I wanted to have the doctor's diagnosis as quickly as possible. He, however, preserving strict silence and a severe mien, mixed some mustard in a bowl, spread it on a piece of flannel (using as much as would have lasted us for six months as a condiment with ham!) and clapped it

to Eugene's side. Then we wrapped up the patient in all the woollen clothes we could lay hands on—socks, sweaters, helmets, gloves, scarves.

Two hours later Peter asked the patient:

"Does it sting?"

"I can't hear a word you say," replied Eugene muffled from head to foot.

Ernst and I advised Eugene to keep on the mustard plaster till morning, so that it should warm him up thoroughly.

Peter has a difficult time carrying out his hydrological work. Before establishing a station he has to scoop the snow away from the hole, then he gets a long aluminium rod and has to spend five or six hours chipping the new ice away from the edges of the hole, shovelling it up with his spade and flinging it to one side. After that he clears the upper edge with the ice-pick, where a considerable quantity of new ice is constantly forming.

Peter now requires hot water all the time. As soon as the bathometer comes to the surface the frost immediately freezes the tap. Boiling water has to be poured over the clamps when lowering and raising it, otherwise we could not attach the bathometer to the cable; naturally, on account of all this, the work proceeds very slowly.

The living-tent is very crowded. The water samples poured into small phials, freeze rapidly Peter has a box for them, lined with skins—but that is not enough. To protect the samples from the frost he fills a rubber hot water bottle with boiling water and puts it on top of the phials.

The depth sounding causes still greater trouble. Peter concentrates most of his attention on the brake, which tells us when the lead reaches bottom: he washes the mechanical parts carefully with paraffin and benzine.

Despite these difficulties never once have I heard Peter complain. He works calmly and confidently and nothing is too much trouble for him. Eugene and Ernst are the same. Each of us not only has his own job, but does whatever he can to help his comrades.

I am lucky to have such a good harmonious team to work with. Experienced polar workers will know how important this is. How many good intentions of various expeditions have come to naught because of squabbles and distrust among the members! We have not had nor shall we have any troubles of this kind.

October 28. Eugene still feels poorly, and we are not letting him go out. Peter has changed the treatment and has now applied cupping glasses. These cups are so big that we could only apply three. Eugene is so thin that there was not enough flesh for a fourth. We kept him in bed all day, but our patient dislikes wasting time, and so while lying in his bunk he worked up the data of his gravitational observations.

We heard over the radio how the entire country is nominating its candidates as deputies to the Supreme Soviet of the U.S.S.R.

We had a radio-telephone conversation with Rudolf Island. Shevelev told us how the elections would be carried out.

The editors of *Vechernaya Moskva* have sent us a radiogram asking for an article for a special page which they are printing, entitled

"Stories of Lucky People," the title is apt ; we are the luckiest of men, for all the Soviet people are with us.

In the evenings Peter continues to study English.

October 29. To our great joy Eugene is recovering. At midday he was able to carry out the meteorological observations himself, and transmitted the weather report to Rudolf Island.

There is still no wind. In the evening we started up the bicycle-generator ! Eugene and I turned it for a long time, while Ernst transmitted two hundred words.

I wonder when these "literary commissions" will stop coming ? We are no longer amused by them, but rather horrified. The latest is from the newspaper *Krasny Sport* which asks : What is your favourite sport and why ? What games do you play ? Perhaps to-morrow we may be asked to furnish answers to questions such as : "What brand of eau-de-cologne do you use ? What is your favourite colour for pyjamas ? What sort of hair-parting do you prefer ?"

October 30. While we were sitting in the tent to-day we felt violent tremors . such as we had not experienced on our floe before ; they felt as though three-inch guns were being fired about two kilometres away.

Ernst and I set off immediately to examine the state of the fissure ; a considerable packing of ice had taken place.

A wind has sprung up. Our windmill is now turning well and smoothly, with no trace of knocking. Ernst was able to transmit six hundred words to Rudolf Island, chiefly for the press.

This morning Peter had intended to distil water, but was unable to remain long in the kitchen owing to the intense frost—36° ; so he went back to the tent, where he industriously studied English.

Eugene freezing in his ice laboratory is a pitiful sight to see. To-day he has put on a hooded deerskin coat ; that ought to make him feel warmer.

It is hard to stay out long in this weather. The frost is not so bad—the wind is worse, it has reached a velocity of ten to twelve metres a second, even piercing through our fur shirts and turning our bodies to ice. It is far pleasanter to stay in the tent. Here the temperature remains for the most part round about zero.

October 31. To-day we heard over the radio that the Soviet Socialist Republic of Karelia has nominated me as a candidate for deputy to the Soviet of Nationalities. This is a tremendous honour and shows how the people trust me. To the end of my days I shall work as strenuously as I have done before for the good of my country.

Peter spent all the day distilling water. He has now accumulated 4 litres of distilled water and this supply will last him for the examination of several stations.

Outside it is quite dark.

To-day we all four ate together—yesterday Ernst missed his dinner, he was asleep at the time and, feeling sorry for him as he gets so little rest, we did not wake him. To cap it all, poor Ernst has developed a boil, which is giving him great pain.

Ernst has taken down fifteen radiograms from Rudolf Island. One of

them tells me that my father has been presented with a radio receiving set. It makes me very happy to know that so much solicitude is being shown to my old man.

Peter is making good progress with his English studies. He is now able to read English books quite freely, seldom having recourse to the dictionary.

In the evening we held what might be termed a "production conference," when we discussed the results of the scientific observations carried out by our drifting station.

Since Fridtjof Nansen's expedition on the *Fram*, the view has been generally accepted by the scientific world that there is little life in the central region of the Arctic Ocean. Animal life in the open seas, as is known, depends on the development of phyto-plankton, i.e., of microscopically small vegetation, seaweed. Of course animals such as bears live by hunting seals. But seals live on small fish and also on large plankton molluscs which, in turn, live on smaller representatives of animal plankton, and these live directly on seaweed.

Thus, vegetable plankton is the basic food of marine organisms. All sea fauna exist on it, just as land fauna lives on surface vegetation. The development of seaweed requires sunlight and certain nutritive salts. Fridtjof Nansen held that, with the thick covering of ice, even in summer time, there was insufficient light for the development of vegetable plankton and that therefore, there could not be much plankton in the Central Polar Basin on which the higher animals could exist.

The great scientist and Arctic explorer, Nansen, who made such gallant attempts to unveil the secrets of the Central Polar Basin, had not the good fortune to do what we were doing in the Stalinist epoch—to drift for many months on an icefloe and carry out thorough scientific investigations. Shirshov's hydrological investigations have disproved Nansen's theory.

At the end of the summer, when the snow layer on the ice begins to melt, a sufficient quantity of sunlight penetrates to the surface layer of the sea: throughout the month of September we observed considerable growth of vegetable plankton.

In the Central Polar Basin there is also a sufficient development of animal plankton, the presence of which makes possible the existence of other animals. North of the 86th parallel on no less than eight occasions we saw gulls flying along the fissure in search of food. Several times guillemots flew past and alighted near the fissure. At the 88th parallel we were visited by a she-bear and two cubs (I have already described our unsuccessful attempt to shoot them). At the same latitude we also saw a sea-hare, and a little later, two seals.

The wide range of our scientific research left us no time for hunting. Nevertheless, we have been able to observe the animals and birds enumerated. They are conclusive proof that the central region of the Arctic Ocean is far from being a barren waste.

These are the serious conclusions drawn from Peter's scientific observations, which we discussed the whole evening.

This is enough for to-day. To-morrow or the next day I shall write about the conclusions drawn from Fedorov's magnetic observations.

I am eagerly looking forward to the rest which I can enjoy till morning. I only hope we have a quiet night!

NOVEMBER

November 1. The newspapers give us no peace, they keep on pestering us to send them articles for their holiday issues. The newspapers published in the towns where we were born ask for especially detailed articles. Needless to say, the special "commissions" continue to pour in.

We should be delighted to satisfy them all, but our accumulators refuse to stand up to the load. It is a good thing that the windmill has been such a help during the last few days. We were able to transmit articles for those newspapers to which we are accredited correspondents. In addition I wrote articles for the Sevastopol and Voroshilovgrad newspapers.

We are all in good spirits. Late in the evening we switched on the radio and listened-in to Iceland.

The wind has whipped the snow up round the tent right to the roof-top. We had to spend a long time shovelling it away.

For dinner we had yesterday's mushroom soup, to which I added water by melting snow, as what was left wasn't enough for all of us. While we were eating it the lads asked me:

"How many days have you been putting water into this soup?"

"It's the last time to-day," I answered. "You've only yourselves to blame. If you had eaten it all up at once I should have had to make some fresh soup, but as you left so much of it, how could I throw it away? So I added a little fresh water."

At midnight we received a radiogram saying that Ernst and I had been elected to the Central Committee of the Union of Workers of the Northern Sea Route.

Yesterday we said good-bye to the 84th parallel. We are now at N. Lat. 83°55′.

Eugene is now sleeping like a log, having completed observations which took forty consecutive hours to carry out. A fine piece of work. Good lad!

I have finished all the outdoor jobs, inspected the dumps, got the oars ready and put them by the clipper-boat in case we should have to transfer to another floe.

We transmitted to a number of towns congratulatory messages on the occasion of the holiday.

When Eugene finished his observations we resumed our discussion on the results of magnetic measurements. These are not merely of theoretical, but also of practical interest; they will help our gallant airmen and navigators in the trans-Arctic air communications of the near future.

Prior to our expedition no one had ever measured magnetic declina-

tions in the central region of the Arctic Ocean, or determined the angle at which the magnetic needle deviates from the true meridian. Yet the declinations here, in the region of the geographical and magnetic poles, alter very rapidly.

Magnetic charts of the central region of the Arctic are based on various hypotheses regarding the distribution of magnetic elements over the earth's surface; earlier expeditions to the Central Polar Basin made no magnetic determinations at all. They are being made for the first time now, on our icefloe, by Eugene Fedorov.

Regularly, every 30 or 40 miles, measurements are made of the elements of magnetic force. These measurements will now serve as a basis for a reliable magnetic chart of the Central Polar Basin.

The taking of magnetic measurements in the Arctic is considerably affected by magnetic disturbances, phenomena known as "magnetic storms," caused by solar radiation striking the upper layers of the atmosphere.

In central latitudes, fluctuations of the magnetic field are usually so slight that they can be ignored when plotting a course for a ship or a plane. But in the polar regions the magnetic field is never stable: the declination may fluctuate 5 to 10 degrees from the mean, and this is of considerable importance to the flight of a plane. Thus, in drawing a magnetic chart the casual variations in the magnetic elements must be distinguished from the mean.

When we take a measurement, we usually observe for a period of 24-hours with the help of special instruments, changes of magnetic force. And in the final reckoning we arrive at a value which shows correctly the actual distribution of the magnetic field.

As we drift to the south the change in the values of the magnetic elements is gradual and even. At the Pole the declination was 40° to the west of the Greenwich meridian. Now the declination has changed by 25° to 26°; the horizontal component has practically doubled; the inclination has declined from 86° to 84.5°.

The steady drift of our floe from the North Pole towards Greenland has enabled us, for the first time in the history of the Arctic, to take precise magnetic measurements over a vast unexplored expanse of the ocean.

We are particularly pleased that our observations have already been of practical value to Chkalov and Gromov in their trans-polar flights from Moscow to the U.S.A.

November 2. As always, Ernst took the night watch. He makes use of the time that he is on watch to write up his own diary. Besides this, during the night he often chats with short-wave radio amateurs of various countries.

At 9 a.m. he made tea. We got up quickly, and started greedily gulping down the hot, refreshing liquid. Possibly, in different circumstances we might have taken our time in getting out of our sleeping-bags, but now we are out of them in a twinkling. What else can one expect—the temperature in the tent is 3° below zero.

During the day I held a class of our current affairs circle : we studied the Stalin Constitution—the basic law of the U.S.S.R.

Eugene is writing an article for a Gorky newspaper. At midday he carried out the meteorological observations and transmitted the weather report to Rudolf Island himself, so as not to wake Ernst, who had only turned in a short while before.

Peter is writing an article for *Leningradskaya Pravda*.

All the papers keep on asking us for articles for their holiday issues ; we have written so much that there seems nothing more to write about.

Merry has again taken to thieving. This time he found his way to a half-hundredweight slab of butter. We caught him red-handed.

How are we to break him of these bad habits ? He is a queer dog—we feed him well enough. Although we dislike punishing him it will have to be done, or else he'll get quite out of hand.

Eugene says :

"If you don't look out he'll eat up all our food reserves . . . !"

To-day for the first time, we saw a great display of the Aurora Borealis. Hitherto we had only seen pale, slender beams sweeping the sky.

I recalled the period of my earlier work at the polar research station on Franz Josef Land. The Aurora Borealis there is exceptionally beautiful ; here it seems much less vivid.

Ernst has taken radiograms informing me of resolutions passed by a number of general meetings of workers to nominate me as candidate for deputy to the Supreme Soviet of the U.S.S.R. This so inspired me and gave me so much pleasure, that I lost all my weariness caused by a long spell of working the bicycle-generator. My comrades congratulated me on this great honour. It shows the trust the workers of our country have in me.

I have always striven to be a conscientious and loyal son of the Bolshevik Party. Now I have made a triple vow to remain so always, to the end of my days.

The others are all asleep. It is already 5 a.m. I lie in my bag, but am unable to sleep. A thousand thoughts crowd my mind. . . . I feel a tremendous influx of energy, and want to work, and go on working. I feel as if the polar night no longer exists !

November 3. This morning Ernst did not, as is his custom after the night watch, go to sleep, but pottered around in the storehouse where we keep our mechanical equipment ; he is making a spare radio station, complete with parts, and a transmitter, for use in case of emergency. It was not till 6 p.m., after he had transmitted the weather report to Rudolf Island and had had dinner, that he turned into his bunk. But he did not feel sleepy. His children, together with the children of other polar workers, were to make a broadcast to-day. Finally he gave up the idea of sleep, and waited up to hear them.

Reception was poor, but nevertheless the broadcast gave Ernst great delight, the children spoke distinctly, and freely, and did not once hesitate.

All day Eugene has been working up the data of his observations on gravitation, in order to liquidate the arrears.

Up till dinner-time Peter was busy clearing the hole for the station he intends to establish to-morrow at a depth of 1,000 metres.

I wrote out replies to my electors, cordially thanking them for the confidence they had placed in me.

I listened-in to "Latest Radio News," and learned that a regiment of Japanese interventionists had been wiped out by troops of the Chinese people, who are fighting heroically for their independence. We were all delighted at this news. All honest people the world over sympathise with the great Chinese nation.

I helped Eugene carry out astronomical observations. It was getting on for 3 a.m. before we finished working.

I am in exceptionally high spirits. I even committed the "sin" of suggesting to Ernst that we have a tot of brandy each. At that moment Peter came in from his laboratory, and the three of us had a drink. Ernst and I turned in at 4 a.m. Peter went on preparing his hydrological station.

November 4. After a sleepless night Peter to-day had only three hours' rest, and then again resumed his hydrological work.

I went off to the kitchen. It is cold in there. Kitchen work is dirty, especially out here on the floe. . . . I have not the slightest desire to mend the primuses, but I realise that it is essential. If we burdened Peter and Eugene with kitchen chores and cooking, the main object of our being here—our scientific work—would suffer.

Ernst has again been contacting radio amateurs. To-day he got in touch with a Frenchman. The Frenchman announced: "Comrade, I congratulate you and your friends on the forthcoming anniversary of the Revolution." Afterwards Ernst conversed with an American.

In the evening before turning-in, Peter studied English.

We have received a radiogram from the *Sedov*; she is caught in a strong drift in the North.

November 5. Ernst woke me with the words:

"What a busy night I've had! I have talked to nine American radio amateurs. They passed me on from one to another. They all know about our expedition."

Again we have received many congratulatory messages. These hearty greetings from the Motherland give us great pleasure! In one radiogram we read that the model of our living-tent has been awarded first prize at the International Exhibition in Paris.

November 6. Peter has started to titrate samples from a station in his movable chest. It is very amusing, this chest. In it he keeps all his glass vessels, test tubes, and other utensils. On the inside of the lid he has pinned the photograph of a famous American film-star—a very beautiful woman. A small electric bulb has been fixed up in the chest.

First thing in the morning I started to make preparations for the holiday. I made my way to the storehouse, opened a trunk containing clothes and took out a set of clean underwear for each of us. From the food storehouse I took a cake and sweets. Then I tidied up the kitchen and cleaned and tidied our living-tent.

At 7 p.m. I boiled some water, so that we could all have a shave and a head wash. An hour later we opened our "barber's shop." We shaved in turns, hurriedly, so as to get finished by midnight. After shaving each one of us kneeled over a bowl made out of an empty food tin, while the other poured warm water over his head.

At midnight Eugene carried out the meteorological observations, drew up the report and Ernst tapped it out to Rudolf Island. In exchange for the weather report the Rudolf Island operator transmitted some more congratulatory messages which had arrived for us.

Then we laid the table, and loaded it well. We had smoked ham, cheese, caviare, butter cake, condensed milk and sweets. We placed a bowl of fruit liqueur in the middle of the table. All these delicacies were placed on a table made out of two food tins.

We seated ourselves around it, and I congratulated the comrades. We drank the first toast to our beautiful Motherland, then another to the Great October Socialist Revolution which had brought such happiness to the workers, and yet another to our beloved Stalin.

We stayed up till 5 o'clock in the morning.

November 7. By 9 a.m. we were all on our feet. Ernst carried out the meteorological observations.

We drank our tea in a hurry, in order to listen to the broadcast of Clement Efremovich Voroshilov's speech from the Red Square in Moscow at 10 a.m.

And now it is 10 a.m. We listen intently to the broadcast from the Red Square. To our delight, reception happens to be good to-day, and we can well imagine what is taking place there, in the heart of Moscow.

We hear the chiming of the clock on the Kremlin tower. Semyon Mikhailovich Budenny inspects the troops, and hails them. . . . We can hear the ring of his horse's hooves on the paving stones of Red Square.

And now Voroshilov has ridden out from the Spasskaya Gate of the Kremlin. Like a peal of thunder, we hear the "hurrahs" and the playing of the brass bands: we hear Budenny reporting to our beloved People's Commissar of Defence of our Motherland.

Now Vorishilov begins his speech. We strain our ears, so as not to miss a word. He speaks of the path trodden by the workers of our Motherland, of the achievements of the country; and then, suddenly, we hear him praising our work, our day-to-day work out here on the drifting icefloe! Clement Efremovich calls it a tremendous triumph, comparable to the flights made by Chkalov and Gromov. . . . What a thrill! We sit speechless, too excited for words. How greatly the Government appreciates our work!

After we had listened to the commentaries of the parade, we ourselves went out to demonstrate, at the very same moment that the first columns of Moscow workers were entering the Red Square.

We hoisted our banners on two big poles. Our banner bore a portrait of our beloved Comrade Stalin, the other was the flag of North Pole Station. Then we marched to the fissure—four men alone amidst the ice of the Central Polar Basin.

I climbed on to a big ice-block and made a short speech. After this we fired three rounds with our rifles and then sent up a rocket which illuminated a large area of our icefield.

Then we returned to the tent and continued to listen-in to the Red Square broadcast.

Later, the mainland radio stations broadcast reports of the holiday celebrations at the frontier posts; in the mines of the Donets Basin, on Soviet ships, on the collective farms of Byelorussia and the Ukraine. Our hearts swelled with pride for our Motherland. There is not a single corner of our land where the workers are not joyfully celebrating this day.

It was 8 p.m. before we removed the earphones. After a short interval we put them on again : Moscow's best artists were giving a broadcast concert for polar workers.

At 9 p.m. Eugene and I made an astronomical determination. At midnight, as usual, we transmitted the weather report to Rudolf Island and informed them of our new position : N. Lat. 84°01′. Which means that in but one minute more and we shall be saying good-bye to the 84th parallel.

November 8. We held a telephone conversation with Rudolf Island. Shevelev informed us that he wanted to ask Moscow to take us off the icefloe in December, as the drift was swiftly drawing our station southwards and there was danger that on the reappearance of the sun we might find ourselves in a region of very sparse ice.

We told him that we were definitely opposed to such a hasty liquidation of our station, particularly during the polar night. We pointed out that we were in no danger whatsoever, and that everything was running smoothly.

Shevelev then said that he would not insist on putting his plan into execution, but would nevertheless keep the planes in readiness; one must always be prepared for the worst.

After this Shevelev gave us a short account of Molotov's speech at the anniversary meeting at the Bolshoy Theatre.

I then suggested to the comrades that they open our parcels that had been flown from the mainland, and that they should enjoy the gifts sent to us by our relatives.

Eugene and Peter spent four hours chipping and clearing the ice from the hole. After that they took a depth-sounding.

A layer of water 2,382 metres deep now separates our floe from the sea bottom. This is not so great. We have been used to depths of 4 kilometres.

Ernst has again taken masses of greetings from all parts of the Soviet Union—from the Crimea to Sakhalin. The press now want us to write articles on how we celebrated the holiday. It seems that the public's interest in our expedition is as keen as ever.

At 3 a.m. Peter proceeded to lower the bathometers to a depth of 2,000 metres, intending to haul them up later in the morning.

I sat down to enter up the diary, but felt very sleepy and decided to put it off until to-morrow.

November 9. Over our morning tea Ernst told us of the fresh successes gained by the Chinese troops under Chu Deh. They have surrounded a Japanese unit and captured much booty. It pleases us to hear of the successful struggle which the Chinese people are waging against the foreign interventionists and aggressors.

Eugene has written an article for *Komsomolskaya Pravda* on how we celebrated the holiday on the icefloe.

Eugene and I had hoped to take our bearings, but a severe blizzard made it impossible not only to see the stars but even to distinguish the nearby hydrological tent.

We listened to the night edition of "Latest Radio News." The announcer read out numerous congratulations sent to Moscow from all corners of the world by the friends of peace and friends of the U.S.S.R. in other countries.

Ernst took another fourteen congratulatory messages sent to us.

On November 21 it will be exactly six months since the beginning of our drift. We have sent a request to the Radio Committee in Moscow, asking them to arrange a broadcast by Leonid Utesov's jazz-band, playing their latest numbers. We also added that it would give us great pleasure to hear the voices of our wives.

We learned to-day of the perilous position of the ships ice-bound on the Northern Sea Route. It is plain that this is the result of slackened vigilance of those polar workers who thought we should have an easy victory over the Arctic.

November 10. Ernst started the windmill, in order to charge up the accumulators. The wind is blowing with immense force, driving up huge clouds of snow. Outside at ten paces visibility is nil.

Eugene worked up his data on gravitation. Later, Ernst set to work fishing for radio amateurs; he succeeded in "catching" two Swedes and chatted to them for half an hour.

During the night I went out to inspect our dumps but could see nothing: the blizzard was blinding, driving the snow into one's eyes; I came back covered with snow.

I fed Merry, filled the lamps and cleaned the chimneys. Then I proceeded to mend my fur shirt—the sleeve is torn, exposing the lining and I look a regular ragamuffin. True, we have some spare new shirts at the dumps, but I want to keep them in reserve. I had to cut off a bit of an old pair of trousers to make a patch for the shirt.

Peter brought me the drum of the automatic-recording anemograph, which was out of order. I took the instrument to bits, repaired the damage and got it working properly.

Eugene carried out the routine meteorological observations at 6 p.m., and after completing them decided not to wake Ernst, but to transmit the report to Rudolf Island himself. The operator there, however, was unable to hear him; Eugene was worrying and wondering what the trouble was. Then it occurred to us that during the day Ernst had been using the short-waves for contacting radio amateurs, and had forgotten to switch over to the long-wave band. So we had to wake Ernst after all, to show Eugene how to switch over.

To-day we did not eat any milk pudding at dinner; we had had it five consecutive days running, and were sick to death of it. The stewed fruit which was cooked several days ago has undergone an amazing transformation: one apricot has puffed out to such a size it won't even go into a teacup.

The sky cleared suddenly, and the stars appeared, but they vanished so quickly that we had no time to take our bearings by them.

Now another severe blizzard has set in, with ground-wind. The gale velocity reaches 9–10 metres a second, whipping up snowdrifts before the entrance to our tent.

Since the onset of the blizzard Eugene had been continually poking his head out of the tent, hoping the stars might appear.

The outside temperature is 30° below zero; in the tent it is 8 degrees above. The wind is blowing from the east. It does not bring frost from this quarter, but usually whips up a lot of snow. When a sou'wester blows the temperature never rises above 30° of frost, and there is no cloud or snow, which is better.

November 11. This morning we rose, dressed quickly, and, as usual sat down to breakfast straight away, without washing.

Peter is the only one of us who, occasionally, if the weather is fine, goes out in the morning and rubs his hands in the snow, but if a blizzard is blowing he dispenses with this hygienic performance. Only on important national holidays and on the twenty-first of each month (our jubilee date) do we undergo a transformation: we shave, wash, sometimes we even clean our teeth! On these occasions a certain amount of banter goes on with comments such as "You must be very popular with the ladies!" And answers such as: "Nonsense!"

To-day Peter received a radiogram from Dniepropetrovsk informing him that he had been nominated as candidate for deputy to the Supreme Soviet of the U.S.S.R., and asking for his consent. He was very pleased and sent a reply in the affirmative. Then he went to titrate the samples from a station, opening up his movable laboratory, which we call in jest the "Co-op shop."

Ernst tried to catch radio amateurs on the air, but to-day he has been unsuccessful.

The astronomical observations show that during the past few days the course of our drift has changed from a southerly to a westerly direction.

Eugene is preparing for a 24-hour series of magnetic observations, and Peter for the routine hydrological station.

Most of to-day I was busy putting our gear straight; in the evening I continued reading Stalin's "Leninism."

"Latest News" often gives us good cause for rejoicing. To-day like the rest of the country we rejoiced with the Moscow constituency that had nominated Stalin, that he had given his consent to stand.

The outside temperature is 25° below zero. It is very unpleasant working in the wind, particularly when carrying out meteorological observations. The meteorological tent is nearly always half-filled with snow; after each observation we carefully clean all the instruments,

but when we return again at the appointed time—only six hours later—the tent is again filled with snow. Cleaning instruments in gloves is an awkward job, but if you touch them with your bare hands it is like touching red hot iron.

Peter is now analysing the samples of his hydrological stations under comparatively good conditions. At first we thought that in order to titrate the samples he would have to stand between two of the bunks, with baize shutting him in all round. He would then have had to work bent double. But now Peter's laboratory is on the table and he is doing his work standing, warmth being supplied by the lamps.

Peter received a radiogram from a Dr. Chechulin, a friend of his in Sochi: "Hearty congratulations to you and your comrades on the occasion of the Holiday. We're sea-bathing."

Peter sent the following answer: "I reciprocate your congratulations. May you have plenty of sea-bathing. As for me, I cannot bathe, as it is a bit cold and windy here."

November 12. To-day it is a rest day in Moscow but we here are working as usual; never mind, we can rest when we get back home; out here each hour is precious.

Eugene gave us a lecture on gravitation, but it did not last long; he adjourned the course till the next session.

The three of us—Peter, Eugene and I—are now sitting on the skins with our earphones on. I am writing up my diary and at the same time listening to an excellent concert broadcast from the Central House of the Red Army in Moscow. We are all pensive and silent. Ernst is asleep, snoring loudly; he is tired out, as he systematically goes short of sleep; Ernst's snoring, and particularly the noise made by the anemograph fixed on the roof of the tent, distract one's attention from the music.

I must without fail wash our eating-bowls to-day; it is now three weeks since we last washed them; they are so greasy, they stick to our hands. At home, in Moscow, I used to be terribly annoyed if there was a single mark on a plate, but out here we have to be reconciled to dirt. It is an immense labour obtaining boiling water from snow. It takes hours. We each have our own spoon and bowl (aluminium and wooden) marked with our initials, so that they should not get mixed up, but Peter, being more finicky than the rest of us, sometimes tries to wash his greasy bowl; he fills it with snow and rubs and rubs it for a long time, but the only result is to distribute the grease more evenly.

Eugene and I took our bearings. Our position is: 83°50′ N. Lat., 2°01′ W. Long.

November 13. I brought in a new tin of food. True, we still have a sufficient variety of food in the other tin for three or four days, but the caviare has given out, and when there is no caviare Peter gets a craving for it. I understand him, and to keep him contented, I went out and got some more caviare.

Armed with my rifle, Merry and I set off for the fissure. The dog is always pleased when he sees one of us with a rifle. To-day he is in particularly good spirits, as I gave him a good feed this morning.

The fissure has changed curiously; new pack-ice has piled up on the edge of the floe. If it were light now we should undoubtedly encounter that old friend of ours, the wily sea-hare. I took a stroll along the fissure and then returned with Merry to the tent.

To-day is my birthday, but I kept it to myself so as not to distract the lads from their work. It was not till 7 p.m. when we were all assembled in the tent, that I revealed the fact to my comrades and poured out 25 grammes of brandy for each of them. They congratulated me heartily and tossed it off.

Ernst is still receiving greetings sent us by public meetings of workers on the occasion of the holiday.

Eugene is exchanging humorous radiograms with his charming wife, Anna Viktorovna, and his six months'-old son, Eugene.

Peter is tidying up the medicine chest.

November 14. Our recent hydrological work might be termed "labour lost." All night we waited for the cable with the lead attached to reach sea bottom, so that we might start hauling it up again; the procedure could not be delayed for a single moment, as a strong west wind was blowing. But the lead, in contrary mood, was very slow in reaching bottom.

Our drift grew swifter, and the cable was driven against the edge of the ice. The lead was then at a depth of 2,500 metres. Peter and I wanted to haul it up, but considering how much labour had already been expended, decided to take a depth-sounding after all. So once more we proceeded to lower the cable.

The lead had reached a depth of 3,500 metres, but still had not touched bottom. Again we started to haul it up. We went on working in this way till 6 p.m.

When the lead reached a depth of 500 metres the cable got stuck; as the two of us had not the strength to release it, we decided to knock-off till to-morrow.

Eugene in helping us to pay out the ill-starred cable, had only wasted his time, and nearly messed up his work on magnetic variations. We were all thoroughly exhausted!

We are waiting for the gale to abate, when we intend to start cutting a new hole and building a snow hut for hydrological work. The original hole is no longer workable: we nearly lost the cable there.

Peter has a tough job at the hole. He did everything humanly possible to haul up the cable when the strands got caught in the ice: he plunged his bare hands into the icy water to free the cable and straighten it, and then with dripping wet hands, went on working in the open air, in 25° of frost, and a piercing wind.

I am full of admiration for, and even profoundly moved by the self-sacrificing work of our young scientists. Only men who know the reason for doing it can work in such a way—men of Soviet, Socialist upbringing. Peter and Eugene, like the rest of us, know that they are working for science, for their Motherland, for a great people. And it is this knowledge that inspires them in their heroic labour.

November 15. We have still not quite recovered from yesterday's spot of bother at the hole.

In the morning Ernst turned-in. I told him that I would wake Eugene at midday—the time for transmitting our next weather report, but I myself fell asleep and slept so soundly that it was half an hour after transmission time when I woke. True no great damage had been done; at 6 p.m. we can transmit to Rudolf Island two weather reports—the midday and the evening report. That is the only way to do it on this occasion, but in the future we must keep strictly to the timetable.

Eugene is very tired. He has again been busy for forty hours, carrying out observations. After he had compiled the evening weather report he crawled back into his sleeping-bag.

Peter has set up a new "sleeping record." He slept without waking for sixteen hours. It is pretty obvious that we are all thoroughly tired out. To-morrow we have another arduous job awaiting us: cutting a new hole in the ice.

I must interrupt my entries now to make use of the fine weather and do some outdoor work—I have to make a new door for the lobby. I can finish the diary before turning-in to-night.

Eugene asked me to wake him as soon as a star appears; he wants to take our bearings. But I shall let him sleep on, he is worn out! As fine weather has definitely set in, no doubt the stars will stay out until Eugene has rested.

I was cooking the dinner, and Ernst was contacting Rudolf Island. Suddenly he exclaimed:

"They're going to broadcast a recording of the speech Comrade Molotov made in the Bolshoy Theatre on the evening of the sixth!"

I immediately turned down both primuses, stopped cooking the dinner and went back into the tent.

We put on our earphones and listened intently to every word of the speech made by the head of the Soviet Government. He spoke of our victories, unequalled in any epoch history has ever known; of our immense achievements.

After dinner Ernst lay down on the skins to rest. He has a wonderful gift of being able to sleep anywhere, at any time and in any position; he never suffers from insomnia, and I really believe he could sleep for twenty hours at a stretch: but that would be out of the question—four times a day, every six hours, he has to contact Rudolf Island by radio; so Ernst takes his sleep in short snatches.

After a good rest Ernst is always cheerful; he jokes, and tells amusing anecdotes drawn from his numerous voyages in the Arctic. By the way, he has parodied the words of a popular song, and now we sing his version: "To drift in distant seas our country sent us."

A notice, reminiscent of those sometimes seen on provision shops in the mainland, has been stuck up outside Peter's laboratory. The words it bore "No Beer," were written in Eugene's hand, but the idea probably originated with Ernst.

November 16. What a rotten night! It was getting on for 8 a.m.

before Peter and I got to sleep. We cannot tell why it was, but we tossed and turned all night; sleep seemed to have forsaken us.

During the night Ernst wrote a long article for *Pravda*; seeing that Peter and I were wide awake he offered us a tot of brandy each. We drank the brandy, but even that failed to do the trick. Peter then crawled out of his sleeping-bag and got two sleeping-tablets. Only after taking these did we finally drop off into a sound sleep.

Four hours later, at midday, Eugene woke us up.

We had some tea and then got ready for the day's work. I sharpened the ice-picks, while Peter fixed up the "bat" hurricane lamp. Then we set out to cut a new hole. Our hydrology has become a nomadic science: Peter makes frequent moves from one place to another.

It was a terrible job cutting the new hole. By the time the second shift—Eugene and Ernst—turned up we had already cut an opening in the ice (like a shaft) of more than 1 metre deep.

The moon is a great help to us, but it would be better still if the "bat" lamps burned properly. Sad to say, they are a complete failure.

November 17. Peter and I continued to work together at the new hole. One of us used the ice-pick, the other shovelled away the small ice with the spade. Gradually the pit in the ice grew deeper. Suddenly we struck water, which rapidly began to fill the artificially-made basin, on which we had worked for more than twenty-four hours. We could not make out what had happened. I brought up a hurricane lamp, and then we discovered we had been cutting the hole on an icefield containing a concealed fissure; so there was nothing to do but to abandon the half completed work.

How terribly disappointing! It was such gruelling work that when Ernst was relieved he was unable to take the radiograms from Rudolf Island; his hands trembled too much from strain and exhaustion. Peter's hands too, were swollen and black; he painted them with iodine, as he has strained the ligaments.

Again we set off to search for a new place. It was 10.30 p.m. before we finished working outdoors.

This is how the Arctic takes her revenge on us for revealing her ageless mysteries. She is constantly erecting new barriers in our path; frequently she destroys the fruits of our labours, compelling us to perform one and the same piece of work twice and even three times over, but none of her rages intimidates us. We have never given up and never shall.

November 18. We experienced severe tremors during the night. Every now and then we heard a hollow booming, but now we are used to these noises on our floe, and they don't worry us much. However, we keep a sharp look out for any changes on the icefield.

After our morning tea we went out to inspect the fissure. Everything turned out to be normal; apparently the ice pressure must have taken place in the north-east.

So far the floe has been behaving well; she "carries" us southwards conscientiously and dutifully. Her dimensions are imposing: 2 kilometres by 4.

On our way back from the fissure we headed straight for the windmill. From a distance it looks like a lighthouse; we fixed a control lamp on top of it and when the vanes turn the bright light looks like a beacon.

When we got back to the tent we briskly rubbed our cheeks with snow: they had got frostbitten on our way back, walking in the face of the wind in a temperature of 32° below zero. It was not a very pleasant journey. Even our dog Merry could tell the difference in the direction of the wind: when we were heading for the fissure he ran in front, lively and frisky; but on our homeward journey, with the wind against his muzzle, he tucked his tail between his legs with the cold.

November 19. Peter's hydrological tent has now been pitched in a new place; we have put a primus-stove and hurricane lamp in it. I spent three consecutive hours sewing-up the tent, thrusting the needle in and out with bare hands, in a biting wind and a frost of 32°. The winch has been placed on a sledge. Peter wasted no time; he prepared the bathometers for lowering to a depth of 1,000 metres.

Towards evening I began to feel rotten: my head ached, I started shivering and had difficulty in breathing. I must have caught another cold, but I hope it's nothing serious.

News editors are again bombarding us with requests for articles: now they want articles on "Six Months' Drift in the Central Polar Basin."

November 20. This morning the lads all insisted that I stay in my sleeping-bag: I had to submit, as if any one of us should fall seriously ill it would mean the other three would have to take on the fourth man's work, for we have no spare hands. Therefore I agreed to stay in for the day.

Eugene took our bearings. Our present position is N. Lat. 83°26′.

Ernst has taken many radiograms congratulating us on the occasion of our six months' drift on the North Pole Station.

Peter took a depth sounding: 3,450 metres.

The temperature has fallen again: 35° of frost.

Peter only had a short rest. It is his second sleepless night. At midnight he went off to work again—to lower the bathometers to a depth of 2,500 metres.

A filling has come out of one of Eugene's teeth. Each day after dinner he engages in an amusing form of "self-treatment": he gets a match, cleans the hollow, and replaces the tiny piece of metal with his fingers. It is the best that can be done; as we have no dentist we are compelled to resort to these primitive methods.

We try to consult our medical specialist in all diseases as little as possible, for to use Peter's own words, his first-aid might prove to be the patient's last.

November 21. It is exactly six months to-day since we landed on the ice at the North Pole.

After breakfast I went along to the fissure and helped Peter haul up the bathometers from a depth of 2,500 metres. In an hour and a half we had hauled up 1½ kilometres of cable. Then I hurried back to the tent to wake up Ernst.

A brilliant full moon is lighting up the whole of the camp. How glad I am to see it; we are so fed up with the blizzards!

To-day Peter, instead of the usual 20–24 hours, only took seven hours to establish his station at a depth of 1,000 metres. This achievement has been due to our placing the sledge and winch by the fissure. Peter no longer has to spend hours breaking through the layer of ice and clearing the hole; now the thin sheet of new ice formed over the fissure can be broken up in 30–40 minutes.

In honour of the "jubilee" I decided to treat the lads to a liqueur. I brought out a bottle of brandy, poured it into a saucepan, added sugar, a briquette of coffee, and placed the saucepan containing this "concoction" on top of the primus. All of a sudden the saucepan burst into flames, which quickly spread to the primus. I seized the blazing saucepan and dashed out of the lobby, but the fiery liquid splashed on to my fur shirt and hands. It was lucky that I managed to extinguish the flames quickly. But my hands still hurt.

About 8 p.m. our team had assembled in the tent, and we settled ourselves on our bunks in festive mood. Ernst was Master of Ceremonies; and announced:

"7.55—put on your earphones!"

As usual, Moscow came on the air punctually. The broadcast had been specially arranged for our benefit. Greetings were read out to us, and also my radiogram to my electors. Then Volodichka came on the air. When I heard her dear voice it seemed as if I had only left home yesterday.

Natalie Petrovna Krenkel and Nadezhda Dmitrievna Shirshova spoke after Volodichka. When they had finished their broadcast, the transmission was switched over to Leningrad, and we heard Anna Viktorovna Fedorova speak; we could tell by the tone of her voice that she was very excited.

The Moscow announcer then took us over to Petrozavodsk, where workers' meetings had nominated me candidate for deputy to the Supreme Soviet of the U.S.S.R.

The concert was broadcast from two towns: artists of the Radio Committee gave us a performance from Moscow, while Leonid Utesov's Jazz Band came over from Leningrad. We were very touched by the kind speech Utesov made about us. His Jazz Band is extremely popular with us out here on the floe.

We are all very grateful to the Radio Committee for arranging this special broadcast for us.

After the concert Ernst made the "brandy-coffee liqueur," I myself, refused to have anything to do with the making of it, for fear of burning my hands again.

Up till 3 a.m. we discussed our six months of work, and resolved to keep on working with undiminished determination and energy.

Over 1,000 kilometres of drift lie behind us. A difficult course lies ahead of us in regions where pressure is likely. We are fully prepared to face whatever surprises the Arctic chooses to spring on us.

November 22. At 2.30 p.m. we held a radio conversation with Rudolf Island. Our comrades congratulated us on our six months' jubilee, and read out letters for us flown from Moscow.

After a relatively long lull the wind has sprung up and is charging up our accumulators. Apparently the wind has taken pity on the four of us and decided to relieve us of our toil with the bicycle-generator.

Yesterday we broke the established rule and did not shave for our holiday. We had, perforce, to renounce this necessary procedure as the temperature in the tent was below zero.

Eugene now operates the radio quite well, and now and again sends over the weather reports to Rudolf Island on his own.

November 23. We arranged with our comrades on Rudolf Island to resume our conversation this morning at 7 a.m., as at 2 p.m. reception is bad: there are so many stations on the air at that time that one drowns out the other.

We went to bed very late last night, and this morning while lying in our sleeping-bags we listened to Rudolf Island. The "islanders" read out letters to us from our wives brought by icebreaker. Although a long time had elapsed since the dispatch of these letters from Moscow, to us it seemed they had only been written yesterday. We lapped up greedily every little news item from home.

There is only a little bit of the moon left. Outside, darkness reigns: at fifteen paces visibility is nil. When Peter, Eugene and I were returning from the fissure we nearly lost our way. A big bank of pack ice surrounds our floe; if the lamp on the top of the windmill is not kept alight one can roam over the floe for hours before finding the tent.

Eugene has had a minor adventure: When he got up this morning we noticed that his nose was scratched and smeared with blood. As he was crawling into his sleeping-bag last night he cried out with sudden pain. We discovered he had pricked himself with a needle accidentally left in the bag by the seamstresses. We extracted the needle and congratulated Eugene on having got off so lightly; it might have been a lot worse.

November 24. The wind is still working for us: the accumulators are well charged up. Ernst is delighted; he can now chat with his radio amateurs to his heart's content. Last night he spent three hours talking to his new found friends: two Leningrad amateurs and one short-wave amateur from Sverdlovsk. As for foreign radio amateurs, they give Ernst no peace at all.

In the night the inside temperature fell to 4° of frost; sitting motionless at the radio receiver is no joke in these conditions. This is why Ernst is so keen to carry out his duties as night watch; punctually, every two hours, he leaves the tent to make the round of the floe, inspecting the dumps, and generally seeing that everything is in order.

During the drift our icefloe has turned round. The pack ice, which previously was on our west is now to the north of us, while the pack ice to our north is now east of us.

All day long we have been hearing a rumbling like gunfire. Our floe

is rotating more and more violently. We are approaching the north-east coast of Greenland where probably there is a considerable piling-up of ice.

Close to the fissure are large blocks of ice which have broken away from our field. They are perched vertically, forming quaint and fantastic landscapes.

November 25. The rumble grew louder in the night.

Taking our lamps, Ernst and I went off to inspect the floe. So as not to lose our bearings we started up the windmill, but it wouldn't function owing to the strong wind. On arriving at the fissure we found no changes, and decided to make for home.

On the way back to the camp we lost our bearings in a blizzard. I bore right, and Ernst turned left. . . . And thus we wandered about in the dark, till suddenly we bumped into one another near an ice-block. This ice-block seemed familiar to me. Once more we set off in search of our camp, and found ourselves some way beyond it.

When we returned we were covered in snow from head to foot, and proceeded to brush each other down with the broom.

I issued a warning to Peter, Ernst and Eugene:

"No one must go far from the camp when the windmill isn't working. If one of us goes out and fails to return within half an hour a rocket must be sent up."

Eugene took our bearings (for breaks had appeared in the clouds) and announced:

"In twenty-four hours we have drifted another 11 miles southwards."

The coast of Greenland is drawing nearer and nearer. Our position now is 83°14′ N. Lat., 5°05′ W. Long.

November 26. Shirshov toiled late into the night, working up his observations of the sea depths. Recently we crossed an underwater elevation, which was a kilometre higher than the surrounding ocean bed.

This morning at exactly 7 a.m. we heard a voice coming over the radio: "Hallo, hallo! Rudolf calling!" In answer to our recent request the comrades read out to us articles from issues of *Pravda* which had been delivered to the island by icebreaker.

At 8 a.m. the broadcast ended; however, we did not go to sleep again, but discussed the *Pravda* articles. Later Eugene left us and went off to carry out magnetic observations.

Peter received a radiogram, informing him that a meeting of workers at Dniepropetrovsk had nominated him as candidate for deputy to the Supreme Soviet of the U.S.S.R.

I am very pleased that two of our party have been nominated candidates. After telling me the good news, Peter went off to titrate his samples.

We have all observed a strange tendency of late: we constantly feel drowsy: can this be the effect of the polar night? If so, why didn't I experience this drowsiness on other occasions; for example, when I worked at the Franz Josef Land and Cape Chelyuskin polar stations?

I busied myself with household duties: I brought in paraffin, filled

up the lamps, fed our fifth pal—Merry, inspected the dumps, mended my fur shirt again.

These tasks completed I cooked the dinner: mushroom soup with pearl barley, powdered meat with buckwheat porridge; stewed fruit. We all ate heartily, though we are tired enough of these concentrates.

In the afternoon Eugene continued his magnetic observations; afterwards he determined our position.

We have had a record drift! In twenty-four hours our floe has drifted 13 miles southwards! We are now taking our leave of the 83rd parallel.

All day long the gale has blown without pause; the gale velocity reached 10 metres a second. The sky is clear, the stars shine brightly, but they cannot replace the moon. Ground-wind sweeps over our floe. The temperature stands at 29° of frost. The wind cuts your cheeks—it is impossible to remain outdoors for long.

At 11 p.m. Peter boiled up a kettle and had a shave.

"Well, well, now you look as handsome as the hero in a fairy tale," joked Eugene. Eugene, by the way, has grown quite an imposing beard.

Ernst has taken a long radiogram from my electors in Petrozavodsk.

I cannot sleep for joy and excitement. How I long at this moment to be able to spend even a few hours with my electors.

November 27. It was nearly morning when at last I fell asleep; all the time the feeling of excitement never leaves me. At times I can hardly believe it possible that they want to elect me—ex-sailor in the tsarist navy, ex-turner—to the Supreme Soviet of the U.S.S.R. It is the Stalin Constitution that raises me to the rank of a statesman!

Ernst had us all jumping out of our bags with his cheery shout:

"Come lads, get up, tea's ready. Look sharp, eagles!"

All through the night, while Ernst is on watch, he takes great care not to disturb us.

Ernst, his fingers numb with cold, stood in the teeth of the gale making pencil entries in the log, after re-setting the automatic recorder in the meteorological tent. He had to blow on his hands to warm them. By contrast it is so cosy in the tent, while the blizzard rages all round us.

At 7.30 p.m. a special Arctic edition of "Latest Radio News" was broadcast from Moscow. Once again we commented on announcer Golovina's pleasant voice.

The drift is still carrying us swiftly southwards. To-day we are already at N. Lat. 82°54'. Only little more than 200 kilometres to the nearest coast. . . . Sometimes, it seems to us that we can smell the land, but alas! it only seems so.

November 28. When on night watch Ernst every two hours enters in a special log, data concerning the weather in our region. This log will be of great value to weather forecasters. Useful too, will be our regular observations of the Aurora Borealis.

We have fixed a rope running from the camp to the winch, a distance of about a kilometre, so that during a strong blizzard we can get about by holding on to this rope, without any risk of losing our way. We had

to use all the silk ropes from our general storehouse and the dumps. We have named this new contraption the "trolleybus line," or simply the "trolleybus."

November 29. Shirshov and I harnessed ourselves to sledges, and holding on to the "trolleybus" set off for the hydrological tent at the fissure; it was quite dark. On arriving at the fissure we set up the winch on the sledge and cleared the hole which, as usual, was frozen over. Peter then proceeded to establish the routine hydrological station.

In the last few days the weather has become much colder. During the day even in the living-tent the thermometer registers about 5° of frost. The only way we can warm ourselves is with food: we try to eat it as hot as possible, and often scald ourselves in the process.

Eugene got very chilled to-day. This evening he crawled into his bag, and we dished him out some hot tea with a dash of brandy in it. Eugene drank it appreciatively and said in a weak voice: "Thanks for warming me up! . . ."

During the night I was unable to sleep, I kept worrying over Peter, who should have returned long ago: finally, Ernst and I set off for the fissure. It transpired that Peter had paid out the full length of the cable—4,220 metres—but still the lead had not touched bottom. Only a relatively short distance now lies between our floe and the coast of Greenland, and none of us had expected such extreme depths in this region.

There is nothing for it but to lengthen the cable by another two or three hundred metres. The Arctic is setting us ever increasing problems.

November 30. By 8 a.m. we had finished hauling up the lead on the winch from the sea bottom.

Eugene was busy making gravitational observations till late in the evening.

Just before midnight Peter went off again to carry out hydrological observations—to lower the bathometers to a depth of 3,500 metres. After completing the hydrological station he will take another depth sounding: we should not like the region over which our floe is now drifting to remain uninvestigated.

There will be a blizzard. The barometer is falling rapidly.

DECEMBER

December 1. Ernst was a long time getting off to sleep; he complained of pains in the heart. On Peter's advice, he took some drops, but they had no effect. Ernst spent a sleepless night, tossing uneasily from side to side. I wonder what we can do to help him?

To-day the Arctic edition of "Latest Radio News" has again broadcast information about our work. These marks of attention are very encouraging, and we discuss the remarkable prospects the future holds for our drift with increasing enthusiasm. Personally, I think we shall be spending several more months on the floe, and that we shall not only

carry out all the scientific work we set out to do, but shall do a bit over and above it. This will be an additional contribution to knowledge of the Central Arctic.

There is no wind, a dead calm, yet we are still drifting rapidly southwards. Our position is N. Lat. 82°46′. It seems a bit out of place now, for us to call ourselves North Pole Station: on a straight line we are roughly 800 kilometres from the Pole.

Round about midnight Ernst felt slightly better and started contacting Rudolf Island radio station. He took a number of radiograms from our relatives, friends, and also from strangers, all congratulating the four of us on our six months' drift.

December 2. Ernst has again been suffering from pains in the heart, and Peter has taken him in hand seriously, giving him all kinds of drops. After Ernst had taken the drops to-day, he felt a little better. Definitely, I am beginning to have faith in Peter as a physician.

All the same, the polar night is taking toll of our health, appetite and sleep. We now eat and sleep less than we did in the summer-time, when the never-setting sun of the polar day shone down on us. This decline in our health is very noticeable, although there are some who consider that the polar night has no effect on man. Now we only eat with appetite and zest at dinner-time; in the morning and evening we eat very little.

There is, definitely, considerable ice pressure taking place off the coast of Greenland. We are holding everything necessary in readiness in case this becomes serious; the pressure—if it comes—won't take us unawares; we shall be able to save all the essential materials for our work and life on the floe.

If we are forced to abandon the living-tent we shall build a snow hut for our living quarters. The most essential articles for human existence on the ice are the sleeping-bags, and we must hold on to these come what may.

We hear over the radio, with pride, that the Stakhanovite emulation movement is spreading more and more widely throughout the country, a number of factories having already achieved great results. I am very glad. Production has increased as a direct result of the growth of the Stakhanovite movement, which permeates every aspect of our national life.

December 3. Last night brought us all a great deal of excitement: Ernst took a telegram informing him that he had been nominated candidate for deputy to the Supreme Soviet of the U.S.S.R. by the Autonomous Soviet Socialist Republic of Bashkiria, Eugene by the Soviet Socialist Republic of Kirghizia, Peter by the town of Dniepropetrovsk.

We could talk of nothing else till four in the morning, congratulating one another on the confidence that had been placed in us.

We have also had a disappointment: the Central Electoral Commission has advised us that polar stations numbering less than twenty-five persons will be unable to participate in the elections to the Supreme

Soviet of the U.S.S.R. We feel very unhappy at not being able to vote for the candidates in the bloc of communists and non-party men.

Eugene continued to work up the data of his observations on gravitation. Peter titrated his samples.

I have discovered from the congratulatory messages sent by Volodichka and my brother Sasha, that my birthday was not on November 13, as I thought, but on November 26. I got the dates mixed up. . . .

December 4. To-day Peter titrated his samples till 6 p.m.: then he ran out of distilled water and had to interrupt the work.

During the day I felt terribly tired and longed to lie down for an hour, to rest. Finally, I lay on my bunk and read material on the history of the Bolshevik Party.

The weather is horribly dismal and overcast; it makes one feel depressed.

December 5. A violent snow storm is raging in the region of our drift.

To-day our Motherland has a universal holiday: Constitution Day. In honour of the holiday we hoisted over the icefloe the State flag of the U.S.S.R. and a banner bearing a portrait of Comrade Stalin. I wondered how we could best celebrate to-day's national holiday.

Ernst and Eugene have received a number of congratulatory messages from their constituents.

It will soon be 200 days since we have been uninterruptedly carrying out our scientific work on the drifting floe. The time has sped by unheeded. One day has given place to the next in intense work of fourteen to sixteen hours a day, and sometimes even the whole twenty-four hours without a break.

We have decided that if Moscow informs us of their intention to send planes for our removal we shall ask for the transfer to be postponed; we shall then be able to complete a series of interesting scientific observations. The region in which we are now drifting is totally unexplored.

The floe has begun to rotate considerably; each day it turns clockwise 6° to 7°. Owing to this, we occasionally have to interrupt the measuring of magnetic variations (although to-day Eugene has stuck to his observatory to do this work). However, the rapid rotation of the floe does not appear to affect the other scientific observations.

Peter's hydrological work is a great strain on him: the wind, the icy water, the blizzards and also the long hours he spends at the hole. . . . To-day, as soon as he came back from the hole he warmed himself, and then straightway sat down to write an article for *Leningradskaya Pravda*. After finishing the article he again set to work on his computations.

Altogether from the commencement of our drift we have taken depth-soundings at fifteen points, established hydrological stations at twenty-six points (from fifteen to twenty-four levels), and carried out a large number of current-meter observations.

Peter suddenly interrupted the thread of my thoughts, exclaiming: "One thousand two hundred and thirty kilometres!"

"From where to where?" I asked.

"That's the total distance, to date, covered by the floe since the beginning of our drift. . . ."

The clouds have dispersed, and brilliant stars have appeared in the sky. According to Eugene's reckoning we have again drifted south-west; the coast of Greenland comes steadily nearer.

At 7 p.m., after transmitting the weather report to Rudolf Island, we listened to a broadcast concert specially arranged for men at frontier-posts and polar stations.

Afterwards I gave the lads a talk on the Stalin Constitution. We spent a long time discussing our Motherland, our victories, and the struggle being waged against the enemies of the people.

In fact we all became so engrossed in our conversation that we missed hearing "Latest Radio News" from Moscow.

December 6. Not a breath of wind; the accumulators are low, and Ernst can only transmit radiograms and articles to Rudolf Island when we turn our bicycle-generator. It takes two of us to work it, a third relieving one of the two after every hundred words transmitted. We have made it a rule on this job not to smoke, as the air in the tent must be kept pure.

After the transmission Peter got some wire and tools and began lengthening the cable.

Meanwhile I was so busy with various jobs that I quite forgot to feed Merry; but his impatience soon drew my attention; he trotted up to me in the kitchen where I was working, lay down at my feet and started whining. I gave him an extra big plateful of food which he quickly gulped down and then started frisking all over the place.

I must give Peter his due: he has plenty of patience. He puts his heart and soul into lengthening the cable! It is a splendid quality to possess; no wonder his scientific work goes so well. . . . To-day, however, Peter met with failure. After spending all day on the cable, he discovered that something had gone wrong. Peter was very upset. It will mean starting this work all over again to-morrow. . . .

In the tent the temperature remains at 3° to 5° above zero. My feet get terribly cold. It makes me wretched to look at them, they're so dirty! Of course, this is hardly to be wondered at—this is the seventh month since we last saw a bath.

I have decided to break off my entries and go out to the storehouse; I will finish the diary to-night. . . .

While I was working in the storehouse I had such bad pains in my heart that I thought my end had come. . . . This, however, is the very last thing I want; there is still a lot of work for me to do for my country. But each day our life grows shorter!

I went back to the tent, took some drops, and got into my sleeping-bag. . . .

Just before I dropped off Peter gave me some good news:

"I've discovered the secret of joining the cable," he said; "now the work will go with a swing."

December 7. Ernst had barely transmitted the morning weather

report when the aerial suddenly collapsed. We all went out to raise it and fix it up again.

We have had some sad news. Radio operator Sima Ivanov—one of the members of our air expedition to the North Pole—has died after an illness. Always calm, kind and cheerful, he was a remarkable person and a good comrade. Though young, Sima had spent many years in the Arctic; he had been radio-operator at the Matochkin Shar polar station; had taken part in the *Chelyuskin* voyage, and had made several polar flights. We have lost a good friend. . . .

After we had finished setting up the aerial we returned to the tent; suddenly we smelt something burning. We looked all over the place and eventually discovered that a cable lying on Ernst's sleeping-bag was emitting sparks, which had scorched the wool.

When Peter had his cable ready we hauled the winch on a sledge to the hydrological tent. There Peter lit the primus and got down to work.

Eugene made an exact reckoning of the length of our drift.

We had mashed potatoes for dinner to-day, for the first time. We have not prepared this dish before, as we only have dried potatoes, which take a lot of cooking. To-day I used the handle of the icepick for a pestle: I pounded the potatoes to a powder, and added milk and butter. The result turned out to be very tasty. Everyone praised this rare "delicacy."

Peter did not return till 1 a.m. He had been establishing a hydrological station at a depth of 1,500 metres.

December 8. Peter came into the tent with the announcement:

"The lead has touched bottom, time for the cable to be wound up."

So Eugene, Peter and I went off to the winch. Shortly afterwards we were joined by Ernst. The ocean beneath us is 3,680 metres deep.

When the cable was wound up Eugene, Ernst and I returned to the camp. Peter remained at the hole, where he proceeded to lower the bathometers to a depth of 3,500 metres.

Towards evening Peter came to fetch me again, and together we hauled the bathometers to the surface.

After finishing this job, we dismantled "Shirshov's farm" as Ernst calls the hydrological tent. We loaded all the gear, etc., on a couple of sledges and hauled them 200 metres away from the fissure. We always do this after a sounding so as to safeguard our hydrological instruments and the winch in case of sudden ice-jamming.

Dinner was very late to-day. We were all feeling dead beat. Peter turned-in immediately after dinner and fell asleep. I, too, felt drowsy, but I decided to stay awake and listen to the evening edition of "Latest Radio News."

Eugene has settled in a corner of the tent on the skins. He is checking the chronometers and preparing the instruments for gravitational measurements.

December 9. Eugene should have taken a short rest to-day, but he nearly always refuses to rest, saying "I can't sit around with nothing

Peter Shirshov, the hydrologist, and Ernst Krenkel, the radio operator, in front of one of the tents

Pack-ice

Eugene Fedorov—astronomer and expert in magnetic phenomena

Krenkel at his radio station

to do." Whenever he does have a few hours to spare, he studies English, of which he has quite a fair knowledge.

I fed Merry, then returned to the tent and wrote an article for *Red Star*.

Eugene attempted to carry out gravitational observations, but was compelled to call it off: our floe is in restless mood, and the instruments quiver from the constant tremors caused by the shifting ice.

The wind has started to blow harder. Although it is dark out here, it is nevertheless, pleasant to see our red banners fluttering in the strong wind. The flags of North Pole Station now fly over the camp all the time, as election day to the Supreme Soviet of the U.S.S.R. is drawing near. This day will be one great holiday throughout the country—a holiday also for us—her "plenipotentiary representatives in the Central Polar Basin" (as our team was called in one of the messages received from the Homeland).

We heard an international review over the radio. Our hearts were filled with indignation when we heard how the Fascists are bombing Barcelona, killing unarmed civilians, women and children.

For the first time the edge of the moon has shown itself above the horizon. Now, with the moon shining it is appreciably lighter.

On the whole, it is none too pleasant living on an icefloe in the polar night. We are drifting towards the coast of Greenland; at times the coastline seems quite close; it seems that at any moment our floe might crash against the cliffs. . . .

We have made it the night watch's duty to keep a constant eye on the state of the floe and on any changes in the weather.

December 10. I got up early and fried potatoes; we all had a good breakfast. Afterwards I proceeded to give the kitchen a thorough turn out.

Ernst helped me.

Eugene continues with his gravitational observations.

Peter is making distilled water.

We have received a cordial message from Spitzbergen, sent by the Soviet miners at the Barentsburg pits. The comrades tell us they expect us home in March and are getting the baths ready for us. . . . They know how to tempt us! I wouldn't say no to a hot bath at this moment!

A blizzard is rising. To ensure sufficient food while the blizzard lasts (we never know how long it will rage), I brought in a fresh tin of foodstuffs and a drum of paraffin. When I opened the tin I found the contents had frozen—the whole of this frozen mass had to be broken up with a hammer, even the sweets and chocolate. The tin must have been badly sealed, and let in water. All the rusks are spoiled; nor does the powdered meat look too good.

Eugene wanted to take our bearings by the stars, but the weather is too foul; the whole sky is covered with thick cloud.

December 11. The violent blizzard continues: at a distance of half a metre one can no longer distinguish a man's form. Gale velocity reaches 12 metres a second. Whichever way one turns one sees nothing

but snow and still more snow. It is only by exerting all our strength that we can push open the tent flap.

Peter took himself off to the kitchen to distil water. What quantities he uses!

I occupied myself in mending the spade; nowadays we have it with us everywhere, to clear ourselves a path in the snow.

At midday Ernst transmitted the weather report to Rudolf Island and took a large number of radiograms, including one for me, from Volodichka.

I played a game of chess with Ernst: needless to say, my chess-teacher won.

After that I went off to the kitchen; it is my turn to cook the dinner to-day.

Towards evening I inspected the dumps, fed Merry, and started the windmill.

How fickle the Arctic weather is! The blizzard has suddenly died down and everything is calm all around. The clouds have dispersed, the sky is clear and the moon has appeared. Our spirits rose immediately. We assembled in the living-tent and drank tea together; we talked for long about the elections to the Supreme Soviet of the U.S.S.R. In the Far East, apparently, the elections have already begun, and I can well imagine the excitement in Khabarovsk and Vladivostok—the streets thronged and tumultuous.

All the same, we are disappointed at not being able to record our votes. Our compensation is that all four of us have been nominated as deputies to the Supreme Soviet of the U.S.S.R.; of this we are very proud.

31° of frost to-day. The wind is blowing from the north which is causing us great anxiety, as we are being driven towards the coast of Greenland—to the north-eastern foreland. With the wind in this quarter we might very well be driven on to the rocks. However, we have become so accustomed to the ice conditions that we are confident our expedition will end happily. Even if only one of us should survive, that one will be able to bring the results of our work to the mainland. The fruits of our six months' work will not be lost; the most important part of it has already been transmitted to Moscow.

Shortly after midnight Eugene took our bearings by the stars; I gave him a hand. We shall soon know our new position.

Ernst switched on the radio and a prolonged, thunderous "hurrah" filled our tent.

"What's that?" I asked.

"Khabarovsk calling," answered Ernst. "The elections have already begun there."

December 12. To-day Eugene continued to carry out gravitational observations. To-morrow he will study the entries on his three days' work.

Ernst made tea and heated up the buckwheat porridge. We all ate our breakfast with relish.

I worked outdoors, pouring paraffin, and without noticing it I got my fingers frost-bitten. If I had not found out in time I might have lost my hands. At least, so Peter, our medico, tells me.

We are being driven closer and closer to the coast of Greenland. We discussed what we should do if our floe broke. I suggested that the discussion be postponed till evening, so as not to damp our holiday spirit.

To-day the Soviet people are electing their representatives to the supreme organ of the State.

Sitting at the radio receiver Ernst tells us of the wonderful spirits of the people throughout the country.

The State flag of the U.S.S.R. and the flag of the North Pole Station continue to flutter over our camp. The moon breaks through the clouds now and again, lighting up the flag and, on it, the silhouette of Comrade Stalin. We treasure this flag of ours, and at the end of the drift, we intend to bring it back with us to Moscow.

After dinner I read Henri Barbusse's book, "Stalin." Thoughts of our country, of Moscow, are inevitably linked with Stalin, the man who has devoted his entire life to the revolutionary cause. Though he is now 58 he does more work than any of us.

Removing his earphones, Ernst announced:

"In Moscow the polling stations are now closing, and the seals are being removed from the ballot boxes."

We all fell silent, as if we ourselves were present at this event. I can just imagine the enthusiasm throughout the entire country.

During the night I took down the flags, and made the round of the camp: I must now get a little sleep, and after that start digging out all our gear. Now, especially, we must be vigilant; at any moment we must be prepared for an unpleasant encounter with the cliffs of Greenland.

December 13. This morning Ernst read to us the sketch he had written for *Pravda* during the night. He writes well and humorously.

I fed Merry. Later Eugene called me; the stars had appeared and he was about to take our bearings.

We now find ourselves 10 miles south of the 82nd parallel.

We have started up the windmill. I think the accumulators should charge up well to-day.

I often think uncomplimentary thoughts about the factory that produced the "bat" hurricane lamps for our expedition. These lamps are always going wrong, they only give a dim light, and smoke continuously. The kitchen is covered with layers of soot. In short these "bats" are useless for the polar night. We swear that when we return to the mainland we will make the factory manager use these lamps for his own lighting arrangements. That will make him sit up!

Moscow radio informs us that the Danish East-Greenland Whaling Company "Nanok" has kindly offered us the use of its food dumps and emergency radio stations, if the icefloe should reach the coast of Greenland: the whaling company's most northerly hut is at Latitude 76°50'.

We thanked the company for their kind offer; however, we prefer living on our own well-tried floe to living on the coast of Greenland,

particularly as the floe is behaving in the most exemplary fashion, gets up to no tricks and serves us obediently.

We listened to "Latest Radio News": polling at the elections to the Supreme Soviet of the U.S.S.R. took place throughout the country in an atmosphere of tremendous enthusiasm. It was a memorable day for all.

We sent the following message to Moscow:

"We rejoice and live in unison with the whole of the Soviet people, the whole of our country."

December 14. This morning I woke up with a severe headache. As soon as I had dressed and had breakfast I went out.

We all suffer from headaches, probably caused by the smoke from the lamps. Once more we would like a few words with the factory-manager who was responsible for the making of these unspeakable lamps. . . .

Ernst and I set off for the fissure. We hauled the sledges, on which we loaded the tent and hydrological instruments. At the fissure we cut a hole, and set the tent up on its former site.

At mid-day Ernst took a thrilling radiogram, informing us that the four of us had been elected to the Supreme Soviet of the U.S.S.R.

I told the lads that I would devote all my life to the Party and would always work like a Bolshevik; I would never let down my country or the Bolshevik Party!

The lads, too, were very excited, and each took an oath of loyalty to the Motherland and the Soviet people.

Eugene, in his hut, was carrying out magnetic observations.

Peter titrated samples from the hydrological station, so as to empty the phials, then went off to his tent to continue with his hydrological observations. Taking advantage of an interval between scientific observations Peter wrote a message to his constituents.

In the evening we all assembled once more. The damp affects us badly: our joints, arms and legs ache. This probably accounts for our tiring so quickly.

Ernst says that our icefloe now resembles a triangle, each angle measuring some 3 or 4 kilometres. A territory good enough for four men!

December 15. I spent a sleepless night. Ernst was on watch; making the round of the camp he was most surprised to discover that I, too, was on the prowl.

During the last few days I have been keeping a sharp lookout on the movement of the ice. We are now drifting in a region where special vigilance is essential.

In the morning we again loaded the winch and scientific equipment on to the sledge and hauled it to the fissure.

Hauling was hard work; the snow had not yet packed down after the recent blizzard and we sank knee-deep at every step. If considerable ice pressure occurs and we have to move the camp to another floe, we won't be able to take much with us. To-day it took the four of us to haul one winch. By the time we got to the fissure we were soaked through with sweat.

Peter stayed at the fissure to establish a hydrological station at a depth of 1,000 metres, while the rest of us returned to the camp.

Yesterday I jabbed my hand with a rusty file, and now my palm has swollen, and I am unable to move my fingers. Following Peter's instructions, Eugene put a hot fomentation on my hand at the same time announcing in pompous tones:

"You are relieved of all duties . . ."

During the day we received from the Central Electoral Commission official confirmation of our election as deputies to the Supreme Soviet of the U.S.S.R. We sat down to write radiograms to our constituents.

In the evening we heard over the radio that throughout the land enthusiastic demonstrations had taken place in honour of the newly-elected Supreme Soviet of the U.S.S.R.

At midnight Peter again went off to work the winch, to lower the lead to sea bottom and take a depth sounding.

The moon shines brilliantly, lighting up our camp; at times we even find ourselves forgetting that this is the polar night!

The temperature is now 24° below zero.

The tent, as usual, is snowed under. It is a job trying to clear the tent immediately after a blizzard for the snow is as fine as dust: we have to wait until it packs down a bit, before we start digging operations.

December 16. Peter turned up at 3 a.m. and woke us with the words:

"I've lowered the lead to the bottom and now I want you to wind up the cable."

We all tumbled out of our bags, though Peter protested again at my taking part in the work. As our physician he considers that my injured hand requires rest: we argued for a long time. Finally he put forward the conclusive argument:

"The time is now a critical one; we can't leave the camp with no one on watch."

So I agreed reluctantly to stay on camp watch till the lads came back. While I awaited their return I made some tea, and when they came back a hot breakfast was ready for them.

Soon after breakfast Peter went off again to the hole, where he lowered bathometers to a depth of 2,500 metres, which will complete the hydrological station.

Ernst is continually receiving messages of congratulations addressed to us from the mainland. Some of the senders likened us to the legendary knights and heroes of old. Legendary knights, indeed! We could not help laughing. My height is 5 feet 3½ inches. Ernst is the tallest of us. However, we all assumed the name of some hero of the Russian epics. Ernst became Ilya Muromets, Peter—Alyosha Popovich. Eugene was nicknamed Solovei-Razboinik, while I became Ruslan and Ludmila.

Carrying out my duties as watch entailed a half-hourly round of the camp, inspecting the floe. At last I could bear the monotony of it no longer, and hurried off to "Shirshov's farm" where I helped Peter haul up the cable.

After that we loaded the hydrological equipment on to the sledge and hauled it back to camp.

We each had a tot of brandy at dinner. The blizzard had prevented a celebration on polling day, so we were celebrating to-day.

At dinner I called for a toast to the health of Comrade Stalin, who has raised our people, every one of us, out of poverty and subjection. Owing to him, we four ordinary citizens have won fame and popularity; and have been given the opportunity to do work of the utmost scientific importance.

Eugene and I took our bearing by the stars, after which he became engrossed in his computations, while I read Henri Barbusse's book, "Stalin."

December 17. Taking advantage of the exceptionally bright moon, I cut up a supply of food for Merry. All the time I was doing this he frisked around me yapping like a little devil. Our dog certainly likes his food!

Ernst and Peter cleared away the snow from the living-tent. During the past few days the snow has piled so high that we find it quite a difficult job to get out of the tent; indeed, we have to crawl out.

I brought out all the rockets from the storehouse. Land is looming close now, and we are constantly on the alert, like hares, expecting ice pressure to occur at any moment. This does not mean we are afraid or losing our nerve. Far from it. But we have wisely provided for everything in case of emergency. I got out an expeditionary tent from the general storehouse and put it on the sledge together with the emergency equipment. We are drifting in the Arctic Ocean, with danger close at hand, but we haven't lost our heads.

Eugene put his bunk to rights. An interesting phenomenon is occurring; our warm breath settles on the walls of the tent in the form of hoar-frost; directly the temperature in the tent rises the frost begins to thaw and runs down the steel tubing on to the upper bunks, in which Peter and Eugene sleep. During the night Eugene had to get up several times, as his sleeping-bag had got wet: a rubber curtain had to be fixed up to protect his bunk. Our "breath" will now run clear of his bunk.

As it was quite light during the night, I left the tent and examined the fissure on its eastern side.

We are all in fine spirits. True, there is a general feeling of fatigue and exhaustion. Obviously this is due to the fact that we have not had one single day's rest and live in crowded quarters, with insufficient sleep.

December 18. When Ernst is on night watch he reads.

"I know the state of the camp by the various sounds," he says.

And it is true; Ernst reacts quickly to the slightest rustle. When he hears a suspicious noise he immediately leaves the tent, takes a good look round, and if everything is in order he returns to his interrupted occupation. It is only when a man is thoroughly familiar with the Arctic and has spent many years in the Far North, that he can trust his ears to this extent.

Ernst tinkered with his radio receiving set for hours. He has changed the valves again, and examined the wiring.

I did some work at the dumps. But there is such a biting wind that it is impossible to stay out long; the wind even pierces through our fur shirts.

Later Eugene and I took our bearings by the stars. Our floe is now at N.Lat. 81°44'. Already we are three more miles south of the Rudolf Island parallel.

As the speed of the drift increases Eugene has not time enough to work up his data on gravitation. He gets less and less sleep. Peter, too, has a great deal of work on hand; hydrological stations have to be established far more frequently than hitherto.

Ernst and I do all we can to help our young scientists; we have released them both from any domestic or culinary duties.

December 19. The wind blew all through the night and made a good job of charging up our accumulators.

The floe continues to drift southwards; we can no longer call ourselves the most northerly people in the world; we would be doing a grave injustice to our comrades on Rudolf Island!

Peter spent the whole day distilling water from ice; by evening he had distilled about 2 litres.

I cooked the dinner, or rather heated it up: we had the soup left over from yesterday when the lads complained it was on the sour side; so to-day I threw some snow into it, added salt and pepper, and thought the result not too bad. . . .

Eugene worked up the data obtained from his observations.

Suddenly Merry started barking; thinking that perhaps another bear had come to visit us, I dashed outside. It transpired, however, that Merry was barking for quite a different reason: ice pressure had started at the fissure, accompanied by the booming noise characteristic of the phenomenon.

As I have already remarked, the greater the speed of our drift, the more work Peter and Eugene have to do; formerly Peter established a hydrological station every fourteen or fifteen days, now the interval has been halved: Peter spends as long as thirty-six consecutive hours at the hole, drawing water samples from varying levels.

The other lads, too, have to put in at least twelve to fourteen hours' work a day.

I have undertaken all general duties; whenever possible Ernst helps me. My old trade of turner comes in useful. Frequently I have to solder some part of our apparatus or to repair an instrument, to mend the oil tanks. This is where my previous experience comes in handy: no kind of knowledge is ever superfluous.

December 20. Our accumulators are well charged up, which makes it possible for us to write and transmit articles every day. By now we must have satisfied all the news editors with whom we have been connected since the beginning of our drift.

In the morning Eugene checked up the chronometers and commenced gravitational observations.

We have saved Eugene's bunk from the unpleasant "floodings,"

but now the water drips on to my sleeping-bag so that I, too, have had to fix up a curtain to protect myself.

To escape the "waterfall" completely is impossible, unless we stopped breathing altogether. It cannot be helped; I'll have to dry the bag each morning over the lamp.

Once again there's a blizzard, and a sharp, gusty wind is blowing. It's difficult to work outdoors, the wind nearly blows one off one's feet. Every now and again we hear a rumbling beneath the tent: the echo of the ice jamming in our region.

I fed Merry and inspected the dumps. Later, lying flat on the snow, I cleared the tent entrance.

I had a hard job hauling a drum of paraffin and a tin of food from the dump to our tent. After this I felt too exhausted to stay out any longer. . . .

During the past two days we have drifted 20 kilometres to the south-west.

December 21. Peter distilled another litre of water and started doing titrations.

At dinner we drank a toast to Comrade Stalin—he is 58 years old to-day. With all our hearts we wished him good health.

A star peeped through the clouds and Eugene went off to take our bearings, but before he could set up the instruments cloud had again covered the sky. We are having no luck at all to-day in determining our position.

When the wind abates we intend to establish a hydrological station. The floe is drifting so rapidly that we are already being carried past the region where we had planned to take a depth sounding.

To-day it is exactly seven months since we have been on the floe.

For evening tea all four of us assembled in the living-tent. Two lamps burned brightly. The temperature was only 4° above zero in the tent but the steaming aromatic tea warmed us up—the finest drink in the world.

We talked for a long time of our plans for future work.

December 22. At last we managed to determine our position, which is N. Lat. 81°07′.

In four days the floe has drifted 37 miles. The speed of our drift steadily increases.

Eugene announced triumphantly:

"We are already half-way through the polar night; every day now brings us nearer to the moment when the sun appears."

An hour later Eugene brought us fresh news:

"We have taken leave of the Arctic Ocean and are now in Atlantic waters."

Thus, to-day marks two important events.

In a month and a half the great dawn will break. The very thought that we are to see it so soon, makes us feel warm.

Peter spent the whole time working in his laboratory in order to establish a new hydrological station to-morrow morning.

We decided to go to bed earlier to-day, as in a few hours' time Ernst and I will have to haul the sledge loaded with the hydrological tent and equipment to the fissure.

The supposition of many scientists, including our own, that with the coming of the heavy frosts and the coalescence of separate icefields, the speed of our drift would decline, turned out to be wrong. In July we drifted 1½ miles a day; in August we did roughly 2½ miles; in November nearly 4 miles a day; now we are speeding southwards even more rapidly.

Peter jokes about it: "We're racing to the south like visitors to health resorts trying to make the most of their holidays."

The direction of the drift has also changed; our general course is now south-southwest. At the present time of writing we are passing the north-eastern promontory of Greenland. The prospects of our "meeting" this headland causes us no little anxiety, as it might result in considerable jamming of the ice. We took the precaution of getting our gear in readiness, assembled a complete set of emergency supplies and are keeping a close watch on the state of the ice. A period has now set in when we must be continually on the alert and ready for immediate action. . . .

Engrossed in entering up my diary, I failed to observe how swiftly the time had flown. To bed quickly! Soon Ernst and I will have some stiff work to do out in the frost.

December 23. My brief night's rest did me no good; I am sleeping worse than ever. Ernst even suggested my having some brandy, to induce sleep. What can be causing this insomnia? Probably the result of extreme fatigue. The truth is, we are all dead beat, although each one pulls himself together and tries not to show it.

During the night Ernst read Alexei Tolstoy's "Peter I." He had to leave the tent frequently to observe the changes in the Aurora Borealis. It was an exceptionally fine night; the wind had dropped, and there was a dead calm.

Towards morning Ernst brewed tea and made an omelette. We breakfasted, then I loaded the sledge, and hauled it to the fissure, where we cut a new hole and rigged up the tent. When we had finished this job we hauled the sledge back to camp, loaded the winch on to it and hauled it once again to the hole. Peter remained at the hole by himself.

We took our bearings; we are taking leave of the 81st parallel.

Eugene has commenced a new series of magnetic observations.

When Shirshov lowered the lead to the bottom the depth turned out to be only 1,420 metres. Then two of us proceeded to haul up the lead from sea bottom.

We all had so much work to do that we had no time even to clear the living-tent: the left side of it is snowed under; and in places the snow-drifts have piled up above the roof.

Shirshov had a short rest and then went off again to work the winch.

It is remarkable that despite the complete absence of wind, the speed of our drift has not slackened.

December 24. To-day is Ernst's birthday, so I mixed a panful of

dough to make pies. At dinner we all congratulated him and each had a glass of brandy.

Joking, yet with a hint of regret, Ernst remarked:

"I've hardly had time to turn around and thirty-four years have flown by!"

We left the winch at the fissure. The gale continued to blow with great violence. After dinner all four of us put on our fur helmets with chin-straps, and roping ourselves to one another, set off for the fissure, where we loaded all the hydrological equipment on to the sledge and hauled it away from the edge.

Gale velocity reached 25 metres a second. In places we could not even walk, but had to crawl. . . . We could see nothing ahead of us; driving wind and snow burned our faces. . . .

After we had shifted the hydrological equipment we again roped ourselves together and in this manner returned to camp, wet through with sweat. Upon our arrival we found that the wind had torn off the plywood roof of Eugene's snow observatory.

Peter is worried that he will not be able to establish the hydrological station at the scheduled place: the barometer is not reassuring.

We are travelling southwards so swiftly that our comrades on Rudolf Island are continually poking fun at us. They have just sent us a radio inquiry: "How are things going with you at the North Pole Station in the south?"

My heart has been playing me up more and more. I have never been troubled with it before. The dampness, too, is playing havoc with me.

December 25. I couldn't sleep during the night I lay awake all the time listening to the gale. The snow beat on the roof of the tent, and at times I felt I was inside a huge drum while a brisk tattoo was being played on it.

The squalls of wind have blown down the aerial; Ernst tried to put it up, but he couldn't stay on his feet in the gale.

We are having another celebration to-day—this time it is Peter's birthday, and in honour of the occasion, this morning we each had a glass of brandy; afterwards we went out to try and fix up the aerial somehow or other.

We had to battle with wind, snow, and frost: it took us till midday to finish the repairs.

Looking at the completed job Ernst said:

"I doubt whether we'll be able to transmit radiograms now, but the aerial will be all right for reception."

Peter has chipped himself a bucket of ice in readiness for distilling water.

As soon as the gale subsides we shall establish another hydrological station, take a depth-sounding, and draw up samples of water from various levels.

The blizzard has snowed up the tent entrance. I have twice cleared the snow from the flap opening of the lobby, yet by this evening it had all piled up again.

Before transmitting the weather report to Rudolf Island we put on our hooded deer-skin coats and went out again to have a final look at the aerial. We have stretched it taut, made it fast, and mended the broken wires; in fact we seem to have put it to rights now.

Ernst is busy setting up contact. He is all smiles; our comrades on Rudolf Island have heard us. They say they have 20 radiograms for us.

This mass of correspondence has excited our curiosity, and Ernst has begun taking it down.

Most of the radiograms turned out to be New Year's greetings from friends and strangers.

We lay in our sleeping-bags while Ernst read each one out to us.

December 26. To dress in our overcrowded tent without banging into someone or knocking things off requires the agility of an acrobat. Eugene manages the feat of dressing better than the rest of us.

Having dressed he checked up the chronometers by the radio signals and then went off to his observatory to carry out gravitational observations.

To-day Peter is completing the hydrological station and also making preparations for the next depth sounding.

I got to work with the spade and dug out sledges and provisions buried in the snowdrifts; Ernst came to my assistance. Our tent is so completely snowed under that Merry romps about on the roof of our palace.

Later, when we arrived at the spot where we usually rig up the hydrological tent we exclaimed in suprise; both the fissure and the nearby hole were snowed under, and all the usual landmarks were unrecognisable.

On his way back to camp to fetch a spade, Eugene fell and hurt his head. We rendered first aid, and then shifted the winch and hydrological equipment.

Ernst and Eugene went back to camp to transmit the weather report and also our replies to the messages of greeting.

Eugene reckons that our icefloe during the last three days has slipped through half a degree and is at N. Lat. 80°32′.

During the day we drew up the plan of our future scientific work on the floe. The farther south we travel, the swifter our drift becomes. Latterly we have been racing south at a speed of nearly 20 kilometres a day: if only we are able to carry out our full programme of scientific observations!

We left the tent in order to make it fast. A slit had to be cut in the fabric but no one had a knife on him, Peter whipped out his revolver and neatly fired a bullet through the spot where the slit was required. Shirshov likes firearms and frequently uses a revolver instead of a knife.

December 27. Ernst is taking so many greetings over the radio that it reminds us of the days preceding the anniversary of the October Revolution. Most of the greetings come from Moscow and Leningrad, and from the polar stations. But there are also radiograms from compatriots we do not know—from Pyatigorsk, Sakhalin, Alma-Ata. We are doing our best to answer all these friendly greetings.

Once again a gale is raging to-day. Eugene remarks facetiously: "We've dropped into a stormy pocket."

It is hard to get to sleep in a gale; one stays awake worrying about the state of the floe, and wondering whether the gale will ruin our work.

Towards morning Merry began barking loudly. Again the thought flashed through my mind that perhaps a bear was around, and I ran out. But it was only Peter whom Merry had seen in the distance, returning from his hydrological tent after completing a depth sounding.

"How deep?" I asked him.

"It isn't in the 4,000 metres now, Dmitrich, only 215 metres," he replied. "I fear our floe may run aground."

Single handed he had to pay out and haul up the lead, remove the jars and stack them in a case, load the case on to the sledge, and haul it back to camp.

He had only taken samples of water from eight levels. Formerly the depths were so great that he used to take them from twenty-five levels. Peter consoled himself with the remark, "Never mind! We shall come to deeper parts yet."

We have again received a batch of radiograms, most of them familiar "commissions" from newspapers to write them something for the New Year about our thoughts, feelings and experiences. Our friends on the mainland seem to forget what a tiny transmitting set we possess.

A blizzard is raging. Once more the snow is piling up with such speed that every ten or fifteen minutes we have to crawl out and clear the tent entrance. In the event of a disaster we should have to dash out quickly and shift all our gear, therefore we must keep the entrance to our dwelling clear at all costs.

Peter and I decided to go out and have a look at the fissure. Prudently, we put on our fur helmets with chin-straps and roped ourselves together.

On arriving at the fissure we shifted all the hydrological equipment back to camp, hauling the sledge with the wind burning our faces.

We are dead beat to-night.

December 28. Ernst spent the whole night at the radio receiver. Towards morning he had succeeded in sending out all our New Year greetings.

I have decided to mend my fur overalls, as the wind blows through the rips.

Peter is making good use of his free time, squatting on the skins studying the data of his hydrological observations. The increased volume of the gale prevents him from going out to the winch.

Ernst crawled out of the tent, but soon returned saying:

"The wind must die down soon; we have been waiting for it to subside for three days. It really can't expect us to go on waiting any longer!"

I agreed with Ernst's "argument" and suggested to Eugene that he should start the windmill in order to charge up the accumulators. After a bit Ernst noticed that the charging was somewhat spasmodic.

We went out to see what was the trouble. Ernst removed the block

of the windmill, I filed it down, cleaned it and then fixed it on again. After this the windmill functioned well. It was then getting on for 3 a.m.

We look after our radio apparatus like a doting mother after her child. We see to every trifle, quickly repairing any damage, regardless of time or weather. . . . Our well-being and the success of our drift depends on the radio station. It is hard to imagine how we would have got on without it.

December 29. Eugene was in no hurry to get up, having decided after three days of continuous observations to set to work studying the data.

In the morning he took our bearings. In thirty-six hours we have drifted 20 miles. Not bad going!

After morning tea Peter settled down to the job of mending his shirt.

Shortly afterwards we received an inquiry from Rudolf Island: "What is your state of health?" We answered that we were all alive and kicking.

Later Rudolf Island told us that Torgovaya Street in Dniepropetrovsk has been renamed "Shirshov Street." On hearing this piece of news Peter smiled broadly.

Again I resumed digging. The work was especially arduous to-day, as there was far more snow than I had anticipated. Eugene, too, cleared away the snow from his magnetic observation tent.

After we had cleared the south dump I hunted out some woollen underclothes, some sugar, a tin of food, and hauled it all back to the camp on a sledge.

New Year is nearly here. Soon we must all have a shave and change of clothes. Who knows, we might even manage a wash!

The editors of *Komsomolskaya Pravda* have sent Eugene a radiogram, asking him to write an article entitled: "Interview with Merry." There are some queer people in this world!

December 30. Peter spent all night working at the hole, and completed the hydrological station. As he prophesied, the depth is beginning to increase; it is now 286 metres. After a long interval Peter has also carried out observations with the current-meter.

On his return he sat down, tired out, grimy, drowsy. After we had breakfasted, I made Peter go to bed.

Eugene is drawing up new graphs for astronomical observations. Before he left the mainland, he had drawn up some as far as the 80th parallel. To be sure no one had thought our drift would take us so far south, and at such a rapid speed.

After Eugene had taken our bearings he announced:

"We are already at Lat. 79°54′."

Goodbye, 80th parallel! . . .

I recalled that Nansen in his drift on the *Fram* was anxious and displeased when the drift of his ship was too slow. We, on the contrary, are worrying because our floe is drifting too rapidly.

But, to tell the truth, we are very tired! This tiredness is beginning

to show in everything we do; in our relations with each other, in our work. Perhaps, we ought to make New Year's Day a compulsory rest for us all, and take it easy the whole day. If we do, it will be our first rest-day during the entire period of our drift.

Such a situation may seem amazing to people living on the mainland, but for us out here, there has honestly been no time for rest!

I must without fail clean up the kitchen for the New Year, sweep out all the dirt from the living-tent, and make things spick and span.

I woke Peter. After we had eaten, Peter mended his trousers, and at the same time memorised some English phrases. We have introduced into our vocabulary an amusing corruption of English words—Russian words with English terminations.

Eugene has chipped the ice off the walls of our tent; the water is an endless source of annoyance to him. As soon as the tent temperature rises, Eugene's bunk is flooded. We chipped off enough ice to fill four good-sized tins; then, with a cloth we rubbed dry the wet tarpaulin of the bunk and replaced the skins over it.

To-night I hope we shall all sleep peacefully. There have been nights when enough water has accumulated on the tarpaulin for small fish to swim about in as freely as in a natural pool.

While I was carrying the dirt out of the kitchen I saw a big tongue of flame on the horizon, alternately leaping up and dying down. It gave me the impression that somebody was waving an enormous red banner. I took up a hurricane lamp and started waving it to and fro, as though in answer to the signals. Then I called Eugene and Peter. They stared at the flame for a long time, conferred with one another and finally concluded that it was a star.

Unconvinced I went on gazing in the direction from which, so it seemed to me, the flame still flickered. I felt elated, thinking that perhaps men with torches were coming towards us. But then I thought again, where would they come from? From Greenland? . . .

Then Eugene set up the theodolite and completely disillusioned me, asserting confidently:

"Yes, that is a star!"

It was long past midnight when we turned into our bags. In a few hours' time we shall wake up and begin on the thorough turn-out of the tent. After that we shall wash our heads and shave. I have arranged to cook enough food to last us for three days.

We intend to see in the New Year properly, and to wish our country every success.

JANUARY, 1938

December 31, 1937—*January* 1, 1938. The last day of the year.

During the night Ernst filled two saucepans with water, obtained from snow, for cooking the dinner. After that he took 21 radiograms containing greetings from relatives and friends.

Thanks, my dear compatriots, for your warm and affectionate messages.

A violent wind has suddenly sprung up, so all my work at digging out the gear has been wasted ; snow-drifts have once more piled up around us.

I fed Merry and then returned to the tent and settled down to cook the holiday dinner.

For New Year's Eve I opened a tin of pressed caviare, got out some sausages, smoked bacon, cheese, nuts, chocolate, and gave everyone thirty-five "Mishka" toffees. After that I cut the flowing tresses which Krenkel had grown. It was an amusing sight. Then we all had a shave and washed our heads.

Before seeing in the New Year we made a tour of inspection round the camp ; we examined each tent, had a look at all the dumps, paid a visit to the fissure, and lashed down the winch.

It wanted only ten minutes to the New Year when we returned, tired out, to our "palace." I proceeded to change my clothes. Peter began to wrestle with me playfully, exclaiming :

"Well, well, you're quite strong, although you're so fat !"

I laughed and replied :

"If we lose our provisions you must promise to eat Merry before you eat me."

Ernst tuned-in to Moscow, and squatting on the skins in our tent we heard all the various sounds in the Red Square ; the playing of the "Internationale," and the chiming of the clock on the Kremlin tower, telling the whole Soviet people that the New Year—1938—had begun ; a year of great new successes for our mighty Motherland.

Then I wished my comrades a "Happy New Year" and we sang the "Internationale," embraced one another, and hoped that 1938 would be just as happy a year as the one just ended.

After this Eugene left the tent to carry out meteorological observations, and Ernst transmitted the weather report to Rudolf Island.

I proposed a toast for the man who is inseparable from our victories, our happiness, our life—our beloved Stalin.

Our New Year's Eve supper lasted two hours, after which we talked for some time about the polar night, so soon coming to an end, when we hoped our work would progress still more rapidly. Shirshov is afraid of the dark. Even before the present expedition, when he used to be employed at polar stations, he felt uncomfortable when left in the dark. It was not so much the darkness he feared as bears, who might stalk a man unnoticed and pounce upon him. Eugene suggested that Shirshov should always carry a weapon, then he would not be afraid of the dark.

Our young scientist, Peter, is becoming more and more attached to his revolver, from which he never parts. On his way back to the living-tent from his hydrological work he generally fires a shot into the air.

Finally we settled down for the night, all except Krenkel who remained at the radio receiver, taking down messages of goodwill from all parts of the U.S.S.R. What a lot of warm, encouraging messages we have received !

We only slept a few hours: Ernst woke us all for tea.

The weather is fine and the stars are shining brilliantly; each star is clearly and distinctly visible.

We are all in fine spirits. Yesterday we decided to make to-day a compulsory rest-day—the first rest-day since our drift began. But the routine jobs still go on; we are all so used to an active life that we cannot sit still doing nothing.

I cleared the snow from the dumps, inspected the fissure, filled up the lamps and then lay down with a book.

Eugene took our bearings; he tells us we are still drifting southwards. Afterwards he went off to his observatory to set up his instruments for gravitational observations.

At dinner to-day we each had two glasses of brandy. I had produced some gherkins from our reserve supplies; they were as soft as a rag; had evidently not kept well, but to us their taste was delicious.

We spent a long time listening to a New Year's concert broadcast from Moscow.

The weather has become warmer, the temperature having risen to 6° below zero. We haven't had such warm weather for a long time; we could even go about comfortably in shorts, if it were not for the violent blizzard. . . .

However, towards evening a violent gale sprang up, and the temperature fell rapidly to 35°C. These sharp changes in temperature cause the ice to crack; all the time it feels as if the floe is breaking up beneath us.

Whilst Ernst was on camp watch he recalled that when we were taking off from the Frunze Central Aerodrome in Moscow he gave Eugene a bottle of good liqueur made by Natalia Petrovna. Ever since that day the bottle has lain in Eugene's knapsack. Eugene brought out the bottle, and we each had a glassful; a few seconds later we were all asleep.

January 2. It will soon be morning, and once again our working-day will begin.

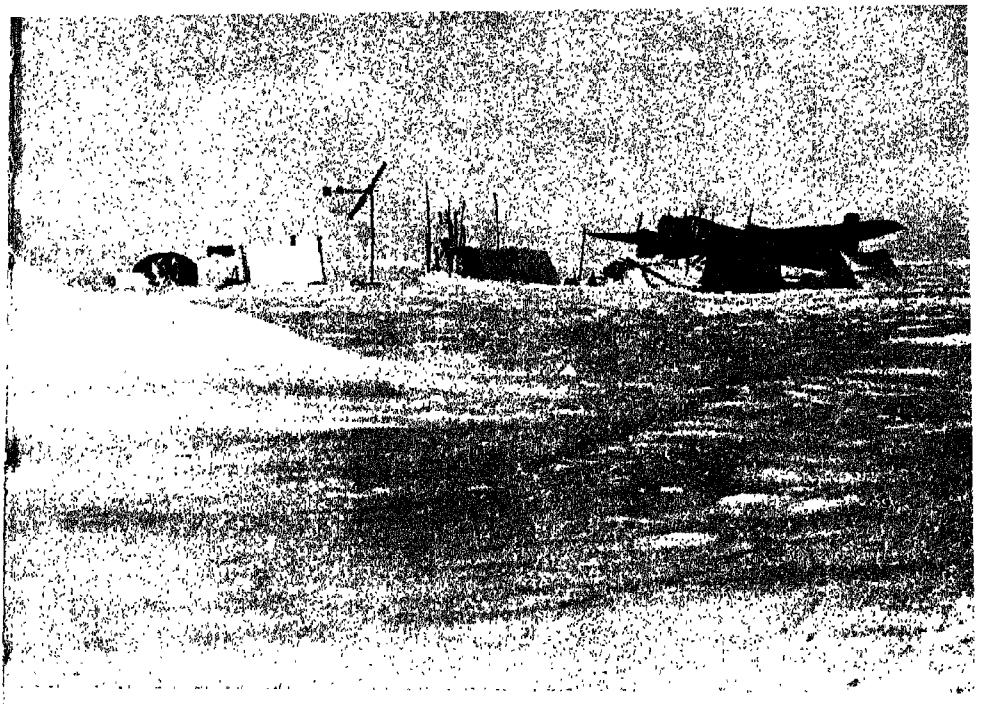
Peter went off to the fissure to carry out observations with the current-meter.

I busied myself clearing snow from the airfields, and afterwards went off to help Peter carry out the hydrological work.

On the way I inspected the rope which we call the "trolleybus line"; it runs from the living-tent to the fissure, where Peter's hydrological winch is set up. The "trolleybus" is a great help to us in the polar night, during blizzards. By holding on to the rope we can make our way from the tent to the fissure and back again without risk of losing ourselves.

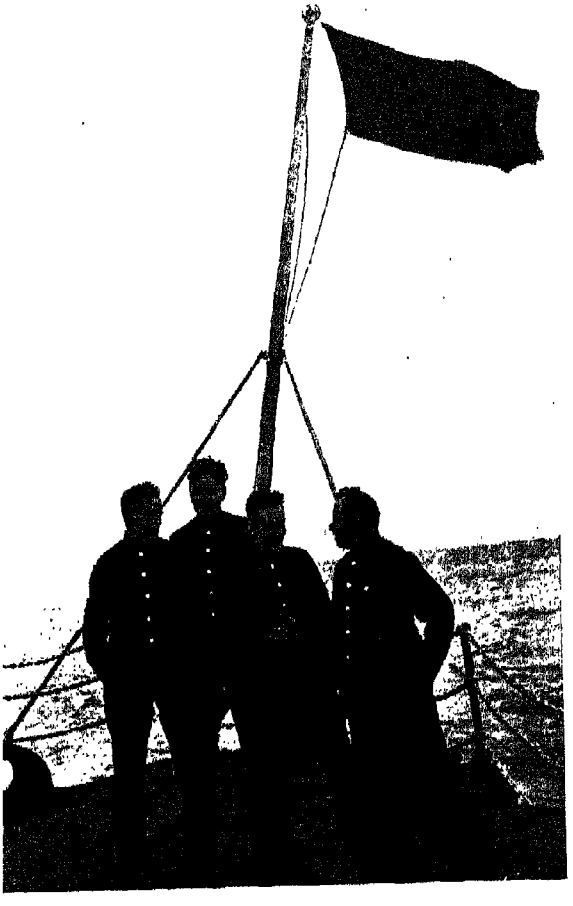
When I returned to camp Eugene and I made an astronomical determination. He "fixed" the stars with his theodolite and I recorded the time by the chronometer.

Our drift has now become so swift that Shirshov and Eugene hardly manage to work up the data of their scientific observations. Hydrological stations, for instance, are established according to schedule every 30 miles. But nowadays the floe covers this distance in two or three days, so Peter has to work as fast as possible to empty the jars of samples



First days at the Pole. General view of the camp

At the North Pole. Hoisting the flags of the U.S.S.R. and the North Pole Station



On board the icebreaker *Yermak*. Left to right: Shirshov, Krenkel, Fedorov, Papanin

On board the icebreaker *Taimyr*. The four back at the mainland

obtained at the previous station. The preparation of distilled water takes up a great deal of time.

The great oceanic depths have now come to an end ; we are now drifting over the Greenland shallows where the variations in depth are only between 200 and 250 metres. Our floe will soon be approaching those regions where the sea depths have already been studied and charted.

Krenkel complains of pains in his side : he must have caught a cold. We gave him a couple of aspirins and wrapped him up from head to foot. As a treat we gave him strawberry jam with his tea.

Towards evening Ernst woke up. I gave him some hot soup which he drank without getting out of his sleeping-bag. He is on the sick list to-day.

The great dawn has already appeared—a narrow strip of light on the horizon. At the end of January, presumably, we may even be able to read a book by the bright glow, but the sun will not rise till later.

We observed a very beautiful display of the Aurora Borealis.

We record in the Station's log everything we observe around us ; not a single phenomenon of nature, not a single fact, is omitted.

January 3. Radiograms of greeting continue to pour in. They come from members of the most varied professions, from friends and strangers, who wish us success, health and happiness in the New Year.

Eugene checked the chronometer and started work on a new series of gravitational observations.

Peter spent the whole night working the winch, observing the speed of the current at various depths. He took a depth sounding : the sea here is 230 metres deep. We are still close to the coast of Greenland.

The barometer is falling rapidly : there will be another blizzard.

To ensure a sufficient supply of paraffin I went off to the dump and hauled drums of oil back to camp. We are taking every precaution against the blizzard.

After working at the hole for three hours Peter returned to the tent and announced :

"I've established the hydrological station !"

We were surprised to hear this, for as a rule Peter's hydrological observations take him from 36 to 48 hours at a stretch. Of course the work is bound to go much quicker now, for not only are the sea depths less, we have become more efficient at the hydrological work.

Ernst still complains of pains in his side, and Peter continues to give him treatment.

As always, after completing a station, Shirshov wanted to go out and fire off a few shots with his rifle.

In the process of loading it, the bolt jammed. This served us as a pretext to examine and clean all our weapons : the latitudes in which we are now drifting may bring frequent visits from unexpected guests, such as polar bears.

We had used up every scrap of power in the accumulators on the transmission of greetings ; it's so rude not to answer people when they send us messages. We were left practically without electrical energy.

But the wind saved us by setting the windmill in motion and charging up the accumulators. Nevertheless we have had to establish a rule for replies to radiograms.

January 4. The moment Ernst contacted Rudolf Island to transmit the routine weather report, the comrades proceeded once more to flood us with greetings and radiograms.

I gave Merry an extra portion of food because of the intense cold, to warm him up a bit more.

During the night Peter cut his finger on a piece of glass. Now our doctor, too, is on the sick list. To amuse him, we played a game of chess, which he won.

The brilliant glow on the horizon increased and each day more and more sunlight is breaking through the camp. It fills our hearts with joy. It is difficult to describe how wonderful the sight of the sun is for men living on an icefloe during the polar night. We are all fed up with the light of oil lamps or, rather, with the smoke of the "bat" hurricane lamps.

Eugene took our bearings. We are drifting very rapidly; in 36 hours the floe has covered 12 miles. Throughout December we covered 195 miles. Peter says that the drift will soon become even more rapid.

Shirshov checked his entries, while I read "Mother" by Gorky.

January 5. All night the gale roared and whistled. The blizzard rages incessantly. Even the windmill has stopped turning, the gusts of wind are so violent. The tent entrance is again snowed up.

It is dark enough normally, but during blizzards not a thing can be seen; our only means of progress is by holding on to the "trolleybus" or two or three of us linking hands. During a blizzard I never allow anyone to go out on his own.

Peter heated up his laboratory to titrate his samples.

My throat is sore, and I decided not to go out, but within half-an-hour I saw that the snowdrifts had already risen to roof-top level. So I had to crawl out with a spade and clear the tent entrance. We are thankful for our hooded deer-skin coats; they are invaluable in severe frosts and blizzards.

Peter knocked-off work in his laboratory and we assembled for dinner. I must admit, we are very tired of powdered foods and concentrates. Krenkel says that at this very moment he could eat a dozen sausage rolls with the greatest relish. He said to me one night, as though in confidence:

"When I get back to Moscow I'll always keep a roll and some sausage in my pocket. . . ."

While the lads were resting I made a new shock absorber for the door of our tent, as our old one is worn out.

In the evening we listened to a broadcast of the opera "The Cruiser Potemkin."

Eugene announced:

"We are now passing the 79th parallel."

January 6. To-day has been a record day in our drift and one of great mishaps.

The night was uneventful. The clouds dispersed and stars lit up the sky, but the wind continued to blow hard.

I read Gorky's "Mother" till morning. Then I went out and inspected the camp, returned, and crawled into my sleeping-bag.

Eugene went off to clear the snow from his magnetic observatory. He discovered that the thread in the magnetic theodolite had broken, which held up his work.

Peter is very upset by the shallowness of the sea in the region in which we are now drifting. The depth beneath the icefloe is only 162 metres.

Eugene calculated that in 43 hours the station has drifted 30 miles. This is the greatest speed we have experienced during the whole period of our drift from the North Pole.

As a precaution I got ready the clipper-boat and the canoe.

Ernst is still feeling far from well. Peter gave him a bromide and Ernst lay down on his bunk to sleep. He complains of severe pains in the chest.

I opened the tin case containing glass chimneys for the lamps and brought them into the tent, warmed them and then wiped them. But within an hour the chimneys had cracked. . . . I had to go out to the dump again. What bad luck!

In the evening we listened to "Latest Radio News," we are following with the closest interest the heroic struggle of the Spanish people against the Fascists.

Over the radio we heard how the school children of Moscow celebrated New Year in the Hall of Columns of the House of Trades Unions. I recalled my own dreary childhood. . . . We all grew up like savages, and celebrated the New Year on the beach, among drunken sailors, fishermen, and gamblers. We never heard anything but bad language. I am glad our Soviet children are so happy.

The dawn glows more and more brightly. Our "polar sun"—a thin sliver of the moon—has also put in an appearance.

The day ended with another mishap. We lost all the paraffin from one of the tins. How annoying! At our station we guard the fuel as if it were our very life's blood; without paraffin and benzine our scientific work would come to an end.

January 7. I opened up No. 3 dump, and got out the sack containing spare deer-skin thigh boots and the last remaining coil of silk rope for making fast the winch, as well as for various household requirements; we had used all the other rope to fix up the "trolleybus line."

Peter has ruined his deer-skin thigh boots; before the polar night set in he used them as a receptacle for storing vegetables! In those days we had some onions which Shirshov stored in his deer-skin boots; We forgot all about them until the severe frost set in, and by that time the onions had turned into a putrid mess.

We are drifting farther and farther away from Rudolf Island, and we cannot always make good contact with their station, which is a great source of worry to Ernst. Neither is our contact with the

station at Barentsburg on Spitzbergen Island satisfactory; the Barentsburg operators are insufficiently skilled.

The barometer is again beginning to fall; the wind is growing keener. This means we shall be snowed under again, and have to go out every half-hour with the spade to clear an entrance through the snowdrifts. . . . The blizzard has only given us one day's respite.

The temperature reached 33 degrees below zero. When you walk against the wind, it cuts your face like a knife. All our talk in the tent turned on one and the same subject—the sun. What happiness the sun gives us! On the mainland we take it as a matter of course. It is only after living on an icefloe in the polar night that one really appreciates the first signs of the dawn.

I have asked Krenkel to prepare a talk on the events of January 9, 1905.

An inquiry has come from Moscow; they are astonished at the speed of our drift, and they want us to confirm our position. Had we made some mistake? I replied that everything was correct; the speed of the drift is precisely as we reported.

January 8. We woke up in the night, speculating for a long time as to whether we should be allowed to drift to the 70th parallel. We should very much like to cover this immense distance on our floe. We expect to be at 70° N. Lat. by March.

We realise that the rapid drift is beginning to cause Moscow anxiety, and that they are already making preparations for our removal from the icefloe. We have been informed that the whaler *Murmanets* is setting out to meet us, and is to patrol along the edge of the ice.

We sent a radiogram to Captain Ulyanov of the *Murmanets*, asking him to take a good radio operator on board, so that Ernst can maintain regular communications with the mainland.

Peter warmed up his laboratory, and I played a game of chess with Krenkel.

Then I put all our everyday gear in order, cleaned the primus and fed Merry. I got very cold, as the outside temperature is 32° of frost, with a biting north wind blowing.

Peter and I went off together to the fissure. We made a lengthy examination to see if there were any signs of ice pressure (we heard a loud rumbling during the night, and felt tremors on the floe). All the hydrological equipment was in place. Nor did we see any signs of pressure at the edge of the ice.

We had difficulty in making our way back to the tent; we were against the wind, and had to hold on to the rope all the time.

Eugene having completed his gravitational observations had also got half-frozen, and could barely stumble back to the tent.

Peter had a quick bite and once more went off to the fissure in order to take a depth sounding.

Eugene and I made an astronomical determination.

In the evening Peter reported that the depth of the sea had increased to 345 metres. This pleases Peter as he is tired of working in shallow depths.

January 9. We are crossing the Barentsburg parallel. We never dreamt that our drift would bring us to these latitudes so quickly!

The blizzard continues. During the night we again felt tremors; somewhere the ice has begun to shift. We are already accustomed to these tremors, but now and again when the floe shudders we find that we get palpitations; our exhaustion and prolonged nervous tension are evidently beginning to tell.

During the night there was a very beautiful display of the Aurora Borealis; shafts of red light radiated from the horizon. We spent a long time watching the sky, though it was very cold outside.

Eugene checked the chronometers and started gravitational observations.

Krenkel brewed the tea and made an omelette. We all ate a good meal although we are sick of omelettes made of dried egg. But there it is; we simply haven't the time to cook a more appetising dish.

Peter was worried, he wondered whether the gale would prevent his establishing the routine hydrological station. Now and again he dashed out of the tent to return downcast, with the words: "It's blowing as hard as ever."

To take his mind off the weather, I suggested a game of chess. But the game didn't hold Peter's attention for long; soon he got up, put on his clothes and went off to the fissure to establish a station, taking the primus with him and disappearing into the dense darkness. I went after him, fearing he might lose his way in the blizzard.

Peter took a depth sounding. The depth turned out to be 288 metres.

We have asked for the call signal of the radio station on the Norwegian island of Jan Mayen, in the Greenland Sea, which station Ernst intends to contact.

When Eugene stays long in his astronomical observatory he goes blue with cold. Sometimes I have to drag him out and force him to warm himself. I did it to-day.

The cursed gale still shows no signs of abating. We must have wandered into the "region of permanent gales." Greenland is certainly making her presence felt!

We are none of us feeling too well, we all complain of nausea. It looks as though the sweets have let us down or some other food from our stores. In future we must take better care of all our provisions, for a trifle may spell our doom.

In the evening Peter took another depth sounding. This time the depth was 249 metres.

I crawled into my sleeping-bag. My legs ache, and I find it difficult even to bend them. The pain is particularly acute in the joints. "Polar rheumatism," which we have acquired out here on the icefloe during the period of our drift, is beginning to tell. . . . Never mind! They'll cure it in Matsesta!

January 10. Peter didn't come back from the hydrological tent till early in the morning. He is now asleep, and we talk in whispers.

We have received the following radiogram from Captain Ulyanov, on the *Murmanets*:

"Leaving Murmansk in the morning for the coast of Greenland."

In addition, we have been advised that the icebreaker *Taimyr* is getting ready to leave Murmansk to meet us. She will carry planes on board.

It is clear they are not going to let us remain much longer on the floe. The Party, the Government and Comrade Stalin himself are taking greater care of us than we do ourselves.

When the blizzard ended I cleared all the storehouses and the passage leading to the tent, and dug out the sledges from under the snow. Afterwards I distilled some water from ice.

Peter woke up and grumbled because we did not wake him earlier.

Peter is a queer chap—he simply doesn't realise that sleep is necessary!

Eugene has completed his gravitational observations.

We spent a long time drinking tea; a drink of which we are all very fond. Eugene says that "tea warms your heart."

I played a game of chess with Peter without interrupting the process of distilling water.

However, we never finished the game because Eugene called me out to make an astronomical determination. The sky was clear, and brilliant stars had appeared in the sky; we could hardly miss such an opportunity.

January 11. Krenkel spent a sleepless night; he was observing the Aurora Borealis and the weather conditions. There was a complete calm.

During the night the two of us walked round the camp together.

"Why don't you turn in, Dmitrich?" said Ernst.

"I'm too excited to feel sleepy," I explained to him.

It is true. Ever since the announcement of our impending removal from the floe I haven't been able to rest. I am longing to see our own Soviet people again.

After making the usual round we returned to the tent and sat down to play chess. After the game I turned into my bunk, but lay awake in my bag till early morning, thinking how soon we shall be returning to the mainland, and bringing back to Moscow the complete results of the scientific work we have done on the drifting icefloe.

When I woke, Peter was bending over me. Apparently I had shouted out something in my sleep which had alarmed him.

Krenkel cleaned the distributor of the windmill charging plant, while I went off to inspect the dumps. There are 32° of frost: the weather is calm, but the sky is overcast.

Peter has four hydrological stations waiting to be worked up, so he took himself off to the laboratory and spends the whole time working up the material.

I cooked the dinner. First course—barley soup (I made enough for five days); second course—buckwheat porridge; third course—cranberry jelly. It took me 3½ hours to cook the dinner. . . . While the

jelly was cooking the barley soup froze, and I had to heat it up again!

The "bats" in our tent are burning very dimly; from time to time they go out altogether—insufficient oxygen. Now and again we open the tent-flap, to allow fresh air to enter, but the freshness soon wears off.

It is just as well that our tobacco supply is running out, it will mean less smoke in the tent. Actually, Ernst is our only confirmed smoker, the rest of us smoke more or less for relaxation before turning-in, and occasionally during the night.

We are now following the radio broadcasts very closely: the First Session of the Supreme Soviet of the U.S.S.R. opens to-morrow.

Eugene is terribly exhausted; his memory is nothing like as good as it was. It never used to fail him like this before. For instance, when he entered up the results of his observations yesterday he left the note-book on top of a tin; later he spent hours searching the camp for it. . . . Eugene simply must get rest.

January 12. This morning I stood outside the tent for a long time, feasting my eyes on the dawn.

On moonlight nights our camp looks like a fairy kingdom. The ice which surrounds us is very beautiful: pack-ice piled high in the most fantastic shapes, floodlit by the moon, and sparkling with a diamond-like brilliance.

Our tent is again buried under snowdrifts. We have cut out some steps in the snow, so as to make our entry easier.

If our icefloe cracks we shall be able to save all our gear with the exception of the tent, which we shall have to sacrifice. It is settled deep down in the snow, for we simply have not enough strength to be continually clearing the snowdrifts.

Anyhow, I have placed the sledges close to the tent entrance, so that when necessary we shall be able to shift everything to safety.

Krenkel has informed Captain Ulyanov of the *Murmanets* at what times we intend to contact his ship.

After dinner Peter collected his hydrological jars and went off to the fissure. He is establishing another station to-day.

I fetched a slab of cake from the storehouse. To-day is an important holiday—the opening of The First Session of the Supreme Soviet of the U.S.S.R. in Moscow.

At the hour of the opening of the Session we hoisted the flags over the camp.

Shirshov was not long in returning from the fissure. In three hours he had established the station and also taken a depth sounding: 186 metres. Our floe is still drifting close to the coast of Greenland.

We listened to "Latest Radio News," which contained a reference to us. The bulletin said that the Session of the Supreme Soviet of the U.S.S.R. had opened, but that four of its deputies were on an icefloe continuing their scientific work. . . .

In the evening, as I sat reading a book, the hoar frost formed on

the ceiling of the tent from the condensation of our breath, broke off and fell on top of me. My bunk and my sleeping-bag were soaked through. I had to spend hours drying everything with a cloth: I spread a new skin over the bunk. Some sort of a gutter will have to be constructed at the side of it.

Eugene continued to work up the data of his magnetic observations.

January 13. The silence of the camp has been broken; throughout the night we were kept awake by all kinds of noises: the howling of the blizzard, the whistling of the windmill as it charged up the accumulators, the rustling of the flags flying over the station, and the crack of breaking icefloes in the distance.

Eugene is carefully drawing on the map the zigzag course of our drift. We are a bit anxious: this chart only goes down to the 77th parallel; judging by the swiftness of the drift it looks as if our entries will have to be made without a map.

The drift is carrying us far to the south. Who would have dreamt that we should drift so far? When we ordered the maps in Moscow it was suggested that we allow ourselves plenty of margin. After some reflection Eugene said that he did not think we should drift beyond the 80th parallel. It just goes to show what radical changes life makes in our plans and theories.

Towards evening we heard on the radio a report of the first meeting of the Session of the Supreme Soviet of the U.S.S.R.

Greetings were sent to us by a number of aviators who had been elected deputies to the Supreme Soviet of the U.S.S.R., namely Heroes of the Soviet Union Mikhail Gromov, Andrei Yumashev, Sergei Danilin, George Baidukov. Six months have passed since they flew over the spot where the icefloe was then drifting.

Peter is continuing to titrate his hydrological samples.

Eugene drafted a radiogram to the All-Union Arctic Institute, dealing with the results of his magnetic observations.

During the night we received a radiogram from the People's Commissariat of Foreign Affairs of the U.S.S.R., telling us that the Norwegians had offered us their services, and giving the situation of the food dumps on the coast of Greenland—if in the event of severe ice pressure, we should have to abandon our icefloe.

This is very kind of them, but I am convinced that we shall not need to avail ourselves of the help of Norway or of any other country; in times of crisis, if our safety is threatened the Motherland will stretch out her powerful hand to us.

Water has once again appeared in the tent. For some unknown reason all the moisture accumulates near the bunks.

A severe blizzard is raging outside. We have an original indicator of wind velocity in the shape of our dog Merry. As soon as the blizzard intensifies he starts to howl mournfully; when the wind dies down so do his howls.

Before turning in we hung our shirts and fur boots on lines in front of the lamps—the only way we can dry the wet fur to any extent. We

have to take great care, however, when drying the clothes and boots, to see that not one drop of water falls on the glass chimneys of the lamps.

January 14. A blizzard is raging. Weather like this isn't fit for a dog to be out in, as they say on the mainland. Nevertheless we have had to banish Merry from the lobby to-day, as a punishment. During the night he slyly crept up to the butter: the marks of his teeth are on the slab. We firmly resolved not to be soft-hearted with our dog, but to punish him whatever the state of the weather. After all, we feed him well enough.

We all got up together, dressed and had tea. One might well think in weather like this that there would be nothing to do. But our daily work went on just the same. Eugene carried out meteorological observations, checked the chronometers and then settled down to gravitational measurements; while Peter copied into a notebook his records on hydrological work. I made a tour of inspection of the camp, and returned wet through: the snow had penetrated through all my clothes. I spent a long time standing in the tent entrance, brushing myself down—there's quite enough moisture in our tent without bringing in any more.

For four days we have not known our position. The clouds hang so low over the floe that it is impossible to take our bearings.

We never miss a single radio broadcast, and listen regularly to the reports of the meetings of the Session of the Supreme Soviet of the U.S.S.R. Abroad, too, considerable attention is being paid to the work of the Session, in the foreign press comments have been made on the high level of activity of the Soviet people and the democratic character of the Soviet Parliament.

January 15. Peter set off for the fissure this morning, to cut a fresh hole in the ice. When we came up he had already hacked out a big pit. Every ten minutes or so Peter would put his ear to the ice, listening intently to the sounds from the sea.

"The ice is jamming somewhere near," he said.

Krenkel and I proceeded to clear away the snow from the tents and sledges. In two hours of continuous work we only succeeded in cleaning the hydrological tent, which we shifted to the new hole. Then we moved the winch to the same spot.

When putting up the tent my hands were so occupied that I had no time to rub my cheeks. I have just noticed that a big red blotch has appeared on my cheek, which is swelling. . . . It really is outrageous—fancy a polar worker getting his cheek frostbitten!

In the evening Eugene determined our position: we are now at Lat. 77°47′.

Peter collected the bathometers, put them on the sledge, and hauled it back to the hole; he is going to establish the routine hydrological station.

January 16. The night brought us a great deal of interesting news.

It was nearly 4 a.m. before Peter returned to the tent. Krenkel and I were awake: Ernst, as usual, was listening to the "news on the air."

Suddenly a voice started calling our radio station. Ernst listened-in.

"Whoever it is, is speaking German," announced Ernst.

It turned out to be the radio station on the Norwegian island, Jan Mayen. The Norwegian operator sent us his best wishes and informed us that the coasts of Jan Mayen were free of ice: everywhere, as far as the horizon there is clear water. Ernst and the Norwegian agreed to maintain regular contact.

From the point where we are now to Jan Mayen Island is roughly 400 miles.

Peter, completely exhausted, flung himself down straight away. Breathing heavily, he told us of his difficulty in getting back to the tent. The gale was blowing at a velocity of 17 metres a second. On his way he had to sit down several times on the pack-ice, to rest. He found it a stiff job hauling the sledge loaded with hydrological equipment.

Despite the terrible weather conditions Peter made four series of hydrological observations, drew samples from 12 levels and took a depth-sounding.

Krenkel got him something to eat, made tea, and gave him two glasses of brandy. It was only after drinking the latter that Peter smiled.

Ever since our floe entered the Greenland Sea a gale has been blowing continually. The person who had called this sea the "pocket of winds," was right enough. The blizzard has confined us to the tent, like badgers in a burrow.

We took a radiogram from Captain Ulyanov of the *Murmanets*. The ship has reached the edge of the ice at the 76th parallel.

This fearful blizzard has interfered with radio contact and to-day, for the first time since the day of our landing at the North Pole, we missed all four periods for transmitting the weather reports to the mainland.

January 17. All night long Krenkel was calling the radio stations on Spitzbergen and the *Murmanets*, but could make no contact.

What a picturesque and beautiful sunrise! The polar night is now definitely coming to an end. The sky has grown so light that at certain hours it is even possible to read. The ice-packs nearest us are all clearly visible.

My thoughts try to probe the future. . . . I don't want them to remove us from the floe before we reach the 70th parallel; we would like to make a hydrological study of the complete section from the North Pole to the 70th parallel, that is, over a distance of 20 degrees of latitude.

Eugene and I left the tent to make an astronomical determination. It has been a hard day for us to-day: severe frost, and biting wind. Eugene is blue with cold. For an hour he had to remain motionless on his knees, doing his calculations.

Eugene has announced, not without a hint of triumph, that in two days we have drifted 30 miles southwards and 4 miles westwards. This makes another record drift.

Magnetic storms have been raging in the Arctic for two days now; which accounts for the short radio waves not getting through. Not only were our own radio communications interrupted, but also those of such

big radio stations as Rudolf Island, Dickson, Archangel, and Tikhaya Bay on Franz Josef Land.

Among the first batch of radiograms taken by Ernst after the interruption, were hearty greetings from my brother Sasha. He tells me he has been admitted to probationary membership of the C.P.S.U. Sasha took part in the civil war and suffers from shell-shock. He has had much experience, but unfortunately is only semi-literate. He will have to study much.

January 18. Once again ice pressure is taking place. We can hear a constant roar, like gunfire from a distance. This noise always reminds me of the front.

I have received a radiogram from Moscow, asking me to give them my views on the prospects of our removal from the icefloe. They say the *Taimyr* is ready to put to sea.

I replied that everything here was all right; that we were all in good health, that the ice conditions are such as not to interfere with our drift, and that I thought it best not to start operations for our removal until March.

The cold is terrible—47 degrees of frost. An unprecedented temperature! I brought in the spare primus stove with two burners, but we consume oxygen in the tent so quickly that we cannot burn both stoves at once.

Shirshov wrapped himself up warmly and went off to his laboratory at the fissure, where he took a depth-sounding: 272 metres. In addition to this he drew water samples from eleven levels.

Although Peter's hands are terribly swollen, he goes on working doggedly and courageously, probing the secrets of the ocean.

Eugene is moving the theodolite to a new spot. He has to do two or three hours' snow-shifting first.

Eugene drew our attention to the moon: glowing and bright red, she slowly sank beyond the horizon.

Day will soon be here.

January 19. I collected my tools and set off to mend our "trolleybus line," which is half snowed-under; at night, in a raging blizzard, it is easy to lose one's bearings, go astray and perish. I drove in several new stakes and tautened the rope. Now the "trolleybus" is in working order again, and Peter will be able to go to and fro from our living-tent to the fissure with a greater measure of safety.

I looked for the airfields which we had made at the time of the expected flight by Vodopyanov and other polar fliers: I spent hours wandering over the camp, but could find no trace of them. . . . Most likely they have been ruined by the blizzards. The ice is covered with huge snowdrifts and banks of snow. But we do not despair: if necessity demands we shall find the airfields, come what may.

Ernst is still anxious that there is no reliable contact with Rudolf Island and Barentsburg.

In this weather we all want to eat our food as hot as possible. Our new method is to pour the soup straight from the saucepan the moment

it is removed from the primus-stove. Sometimes we scald ourselves, but it's worth it in order to swallow something hot, especially during blizzards and severe frosts.

The stars have turned yellow—dawn is really breaking. It was so light I had no need for the hurricane lamp when I was mending the "trolleybus line."

I can't get warm to-day no matter what I do; must have caught cold; if only there was somewhere we could get dry. Ernst says the only way we can dry our clothes is by the heat of our bodies. . . .

The temperature of our tent has been 6° below zero. I crawled into my sleeping-bag, but still continued to shiver.

The radio has announced the conclusion of the Session of the Supreme Soviet of the U.S.S.R. Moscow held a huge demonstration, many thousands strong, in honour of the Session.

Later the deputy to the Supreme Soviet from the Karelian Autonomous Soviet Socialist Republic came to the microphone and conveyed greetings to me on behalf of my constituents. He told us that Karelia was looking forward to my return, and that they were confident in the lucky outcome of our expedition on the drifting icefloe.

Lucky? We never even use this word, which presupposes an element of chance. We have prepared against every contingency so carefully that out success is assured.

We have received a telegram from the Northern Sea Route Central Administration concerning the plan of operations for removal from the icefloe. This plan was drawn up on Comrade Stalin's instructions.

We work on completely unperturbed.

January 20. We felt a severe ice tremor to-day. We all dashed out of the tent to see whether our floe had split, but in the vicinity of the camp everything was in order, and we did not care to go any distance beyond the camp.

We returned to camp for dinner. Peter and I had a game of chess.

After finishing the game I left the tent, folded the flags, and put away all the gear that tends to "stray" when a wind gets up, as we are expecting a storm.

The *Murmanets* is now roughly 200 kilometres away from us.

Peter has gone off to his usual work at the winch. He will take two depth-soundings and carry out six series of hydrological observations, lowering the current-meter into the sea eighteen times.

In the evening Peter hauled the sledge loaded with his equipment back to camp and made the following announcement:

"Our icefloe is surrounded by clear water and cut off from the neighbouring icefloes. It is only 300 metres from the living-tent to the nearest edge of ice."

This means we are now living on a small island of ice, which is in constant motion and subject to every hazard.

So our famous fissure has parted—and the winch and hydrological tent happen to be on the other floe. This equipment we must save without delay and move well back from the edge of the ice.

Hastily we loaded the canoe on a sledge, harnessed ourselves, and set off on a "salvaging" expedition. Arriving at the edge we lowered the canoe on to the water and Eugene and Peter paddled off to the neighbouring floe. There was a fog at the time and to make sure the lads would not lose their bearings Ernst and I lit two "bat" hurricane lamps. The lads soon returned, having done all that was necessary. They showed real courage in the enterprise.

January 21. I was up all last night, finding out for myself how the Barentsburg radio station functioned. They have a poor radio operator there.

It was nearly morning before I crawled into my sleeping-bag. Just before dropping off I glanced at the barometer—the pressure was falling steadily—no hope of escaping the storm!

I soon woke up and heard Ernst saying:

"Listen to the rumbling—that means the ice pressure has begun . . ."

I ran out of the tent; groans, moans and cracking greeted me all around. To tell the truth, I never expected the ice jamming would be accompanied by such a terrible din.

Peter and Eugene followed me out. They were both on their toes, taking a sharp look round. Krenkel and I undertook to inspect the ice-packs, and Peter hurried off to his hydrological tent.

When we returned to camp we immediately began to get the sledges ready, in case we should have to transfer to another floe. We are keeping all the scientific materials and the radio station—our most vital possessions—in readiness.

Soon Peter returned and announced:

"The fissure has widened even more!"

We decided to get into the canoe and bring over the instruments which had been left on the other side of the floe. The canoe had become snowed under during the day, and we had a stiff job digging it up and clearing it; then we loaded the canoe on to a sledge and hauled it to the edge of the ice. But we found we were unable to lower the canoe on to the water at this spot—the clearing was filled with broken ice.

So we trudged down the fissure to find a place free from this broken ice. We wandered about for a long time until we finally came on a narrow strip of water, where we lowered our canoe, and Eugene and Peter stepped in. Ernst and I placed lighted hurricane lamps along the edge of the ice, to serve as beacons for their return journey.

When we got back to camp the fog had become even thicker. On our homeward journey we had to grope our way, moving in the tracks we had made earlier in the day. From time to time Ernst would lie down flat in the snow, and flash his torch on the tracks to make sure we were on the right path.

I placed the emergency radio receiver on the sledge, made some tea, and am now sitting down and writing up my diary. Eugene and Peter may be back soon.

Merry has started barking: the lads have come back with the sledge and the canoe but alas—no winch, it was too heavy to haul over.

Another blizzard has set in. The snow whirls madly, forming high snowdrifts, completely obliterating the tracks on the ice.

We crawled into our sleeping-bags, like animals into warm burrows, but every half-hour we raised the tent flap and peeped out. Finally, we could not stand it any longer and got up.

Peter takes things very coolly; he is playing chess with Krenkel.

Eugene has started on some inside "icebreaking": ice has again formed over his bunk. Using his knife he chipped out several small tinfuls of it. On my bunk, too, all the skins are frozen stiff, like boards.

Without having discussed the matter previously, by a tacit understanding as it were, we agreed to show no anxiety about our position, and appear quite calm. At least we don't worry one another; this, perhaps, shows the harmony existing in our team.

Because of the infernal ice pressure the talk on January 9, 1905, which Ernst was to have given to-day has been postponed till to-morrow.

The violent crackling in the aerial prevents us from listening to "Latest Radio News."

I left the tent to clear away the snow from the entrance. When I opened the door there was a solid wall of snow facing me.

Gale velocity has reached 20 metres a second. The barometer has fallen to 720 millimetres. . . . Very few meteorologists on the mainland have ever observed weather conditions like these!

We are unable to take our bearings; heavy cloud hides the stars. Eugene attempted the journey to his observatory, but he soon returned, saying:

"The wind knocks you off your feet."

Eugene then suggested we should dig a trench to lead from the kitchen to his observatory. This would make a sort of underground passage in the snow, and his work would not be held up by blizzards.

I collected all the tools, primus-stoves, needles, the emergency reserve supply of fuel and food, and dumped them in one place. We must keep all we need within easy reach, as danger may be upon us at any moment

It is exactly eight months since we have been living and working on the icefloe. We have become so accustomed to it that we often forget the raging ocean beneath us and around us.

During the first months of our life at North Pole Station we celebrated each jubilee with great solemnity and pride. For us the twenty-first of each month was a holiday date; we used to shave, wash, drink brandy and cook a sumptuous dinner. . . . Now we have no time for holiday celebrations and banqueting: the ice pressure is too constant a reminder that we live on "shifting ground," and that we are faced by much unpleasantness.

January 22. During his night watch Ernst cleared the snow from the lobby. Every time he wanted to leave the tent he had to burrow his way through the snow. A stranger seeing him would have imagined he was a bear crawling out of his lair.

In the morning Ernst overhauled the windmill.

Shirshov and Eugene took our bearings.

Captain Ulyanov of the *Murmanets* called us at midday:

"Ulyanov at the microphone," he said. "Judging by your latest position I am not very far off from you, about fifteen miles I should say. Light lamps, or send up a rocket."

We asked what his position was. There appeared to be some mistake. The *Murmanets* was not 15 miles but about 150 miles away from us.

Deep in our hearts we were proud that Soviet men manning a tiny boat were ready to face any difficulty, in order to remove us from the icefloe.

Peter went off to examine the edge of the ice, while Ernst and I walked away in the opposite direction, towards the fissure.

Eugene hunted for his laboratory, but could not find it anywhere; it was buried under the snow. Fearing to miss his routine magnetic observations he decided to postpone his digging until the evening.

I returned to the tent feeling a bit more reassured: I found no signs of any fissures on the floe; but water surrounds us on all sides.

Peter went off to titrate the water samples, while Ernst went to bed.

We have dug a trench from the living-tent to Eugene's observatory: it turns out to be quite a strong tunnel. In places we had to cut the trench through big snowdrifts.

All the forms of transport used in Moscow are now represented in our camp: we have the "Trolleybus line," and the "Metropolitan," which we have named after E. K. Fedorov. Now, by taking this "Metro" Eugene is able to do his gravitational work whatever the weather may be like; previously we never allowed him to leave the tent during a blizzard.

The sky is steadily growing lighter. Or rather, rays of ever brightening light are breaking through the polar night. Ernst is enraptured:

"Never before have I seen such a beautiful dawn!" he exclaims.

At last the wind has begun to die down.

We hoisted flags of mourning, to commemorate the death of Vladimir Ilyich.

In the evening we all assembled in the tent, and Ernst gave his talk on January 9, 1905. When it was over we talked about Lenin and Stalin for a long time.

The barometer is rising as swiftly as it fell yesterday.

January 23. Krenkel spent last night in fascinated observation of the Aurora Borealis which was particularly beautiful; Ernst went out every hour to register the form it took.

I made a trap-door in the roof of the tent, so that we might make a hasty exit in case of emergency. Then I collected the skis and stocks and placed them at the tent entrance.

Peter is studying English, and Eugene is entering up his diary, humming a tune to himself the while; he is in singing mood to-day; perhaps because he can now work in all weathers and is no longer at the mercy of the blizzard!

The Norwegian radio operator on Jan Mayen Island tells us the sun has already risen beyond the 71st parallel. How lucky those chaps are

to have seen the sun already. What delight it brings to man! We wait for the sun impatiently; we don't think it will be long now. We have arranged a big celebration in honour of the sun's appearance.

At present we have only the great glow here, but even that brings us light and joy.

January 24. Ernst made the tea this morning, and we had breakfast together.

Eugene announced that we were now at Lat. 76°29'. I played a game of chess with Peter, as it was still too early to work in the camp, the glow had not yet made its appearance.

Ernst transmitted the weather report to the radio operator on the *Murmanets*, who, however, was unable to take it correctly. Ernst is annoyed, because he has to start the transmitter several times, thus using a lot of energy.

By midday I had got the place shipshape and was on my way to examine the fissure, which has widened very considerably. The polynia is covered with a thin layer of new ice. The ice is in a state of stress, breaking and crumbling. Our floe is in a continual state of shock, as though it were being pushed by a monstrous, invisible force.

Eugene says it is impossible to carry out astronomical and gravitational observations while the floe is shaking so violently; the instruments are sensitive and react to each vibration. It is as though we were living in an area subject to continual earthquakes.

I walked alongside the fissure for a couple of kilometres, listening to the roar of the breaking ice. What an awe-inspiring force! Calculated to alarm anyone witnessing it for the first time.

Peter collected his equipment and we both went off to the hole to establish the hydrological station. The hole and the winch are now on the other floe; to get there we must cross over thin new ice.

I led the way, sounding the ice with a stick, and deciding it would bear. The two of us hauled the sledge, clambered over to the other floe, pitched the tent and put up the winch beside the hole. After this I returned to camp, while Peter stayed behind to peg down the tent.

Eugene has carried out two magnetic observations.

A new fissure has appeared on the surface of the floe, but we are unable to ascertain its depth.

In view of the dangers entailed in hauling heavily laden sledges we now hold the straps in our hands instead of putting them over our shoulders, as a precaution against being dragged into the water should the sledges crash through the ice.

January 25. Peter has not returned since he went off yesterday to establish the hydrological station.

The *Murmanets* has informed us of her position. She is sailing in a storm-belt, along the edge of the ice. As contact with Rudolf Island is very poor, we reported our position to the *Murmanets*, who relays our report to Moscow.

In twenty-four hours we have drifted 5 miles southwards.

Eugene has made use of the "snow metro" for the first time. He

regrets, now, that it was not built at the beginning of the polar night.

I must break off my entries now, and go off to the fissure to see how Peter's work is progressing, and whether he needs any help. In fact, Peter's working on the other floe causes me great anxiety; at any moment he may find himself completely cut off from our camp. It transpired that Peter had already established the station, taken a depth-sounding (203 metres), and carried out six series of current-meter observations. He and I hauled the sledge laden with bathometers and cases containing water samples back to our floe.

After dinner, Peter could contain himself no longer and hurried off again to take current-meter readings.

We have received information on the progress of the *Taimyr's* preparations for sailing. Equipment and planes are being loaded on to the ship and the personnel of the expedition is being selected.

There are now constant breaks in our radio contacts; we cannot send even the briefest radiograms to our families; also the weather reports are delayed.

Once more we have cleared away the big snowdrifts which the blizzard had piled up around the tent.

I ascertained the length of the new fissure; it looks to me as if a piece of ice measuring about a square kilometre will soon break away from our floe.

Peter has returned. Except for a short interval he has been at work exactly twenty-four hours, and besides establishing the hydrological station has carried out a second series of observations with the current-meter. On his return he sat down without delay to examine the results obtained.

Ernst's duties are increasing: he now maintains contact with the *Murmanets*, and with the radio station on Jan Mayen Island.

I insisted that Peter should stop his work and turn in. So he crawled into his bag and slept for thirteen hours!

January 26. This morning Krenkel proceeded to contact the *Murmanets*. Ernst transmitted our weather report to her, but dared not add a single superfluous word, as our accumulators are low and there is no wind.

I mended my fur overalls. Afterwards I went off to clear away the snow around the tent.

Eugene checked the chronometers by the signals of the English radio stations and commenced gravitational observations.

I have decided to use our "snow metro" as a storehouse: I dug a hole in the wall of the tunnel into which I placed tins of benzine. Thus the benzine store will be near our tent; an added advantage in case we are compelled to abandon our floe in a hurry and have to take fuel along with us.

In the south, reddish clouds have appeared; it looks as if the sun will appear at any moment now: the stars can no longer be seen.

How we all long to live in the daylight!

We spent an unsettled night, with the blizzard howling ceaselessly.

January 27. The howling of the wind continues without a pause, nor does the blizzard show signs of dying down. From time to time small hailstones drum on the roof of the tent. Peter spent a sleepless night. Three times he got up and each time said to Ernst:

"Come on, let's have a game of chess. I simply can't sleep."

So they played three games before morning. Then Ernst insisted that Peter should rest, saying firmly:

"Not one more game: you must try and sleep to get some strength into you; we've still a lot of work ahead of us."

The *Murmanets* informs us that she continues to move in a belt of violent storms. Our floe is situated in the same storm belt.

It is a job to get out of the tent now; the snow has blocked up the entrance, and when you do get out the gale knocks you down.

Eugene reached his observatory by the "metro" and settled down to gravitational observations. Eugene's suggestion to construct the "snow metro" was brilliant. We light up the tunnel by means of a "bat" hurricane lamp.

Peter has drafted the plan of his future book. Eugene also came in to do some writing; when carrying out scientific observations he has fifteen minutes free in every hour; he uses this time for making notes.

To-day for the first time we did not transmit the weather report either to Rudolf Island, or to the *Murmanets*, but to the Norwegian radio station on Jan Mayen Island: Rudolf Island is still unable to hear us.

The Norwegian radio operator asked Ernst naively:

"Do you know that you are to be removed from the floe in February?"

"Of course we do," answered Ernst.

The blizzard has deprived us of our one and only pleasure: our daily listening to the broadcasts from the "Comintern" radio station in Moscow. The wind roars in the aerial and there is a horrible crackling in the earphones; it is impossible to make out a single word.

I played a game of chess with Peter. During the game it occurred to me that some champion had at some time challenged me to a chess match. And to-day I have only just mastered the rudiments of the game! There has been such a load of work that we have not had much time for chess. I recall many an occasion when sitting down to write up my diary, I could hardly grasp the pencil between my fingers. I have never in all my life been so tired as during these past few months. But then, we all long for rest. Indeed, it is not easy living and working continuously during the polar night on a drifting icefloe in the middle of the ocean. But soon we shall be back in our beloved homeland, and then for a thorough rest.

Yes, a holiday! That's what we all long for.

January 28. The gale still shows no signs of abating, making it impossible for us to leave the living-tent to get any fresh air, though we are sorely in need of it, after the smoke and thick atmosphere inside our "palace."

At times we even feel our heads beginning to swim, but there is not much point in going out where it is impossible to stand—one can only lie in the snow. The force of the wind is terrific.

Krenkel made coffee and pancakes for breakfast. Afterwards he contacted the *Murmanets* and transmitted the weather report. The *Murmanets* is sailing south along the edge of the ice.

During a blizzard the lads get rather depressed. To cheer them up I suggested a glass of brandy each; my suggestion met with instant approval.

We sat in the tent sipping the brandy and discussing our work, our scientific observations, and our future life on the floe, wondering why they were in such a hurry to take us off our icefloe. To-day we were informed that the *Taimyr* was getting ready to put out to sea.

Eugene sat without stirring for a long time, pencil in hand; finally he said:

"After all, we've already drifted more than 2,000 kilometres, and carried out quite a bit of work."

It pleases us all to feel we have justified the confidence of our beloved Motherland and our dear Comrade Stalin. We shan't be ashamed to return home!

When they landed at the North Pole, the chaps who flew back to the mainland, to Moscow, left us with these parting words:

"We hope you won't let us down."

I have constantly borne in mind the lines that Comrade Stalin and the leaders of the Party and the Government wrote us in May last year:

"We are confident that the brave men who are remaining at the North Pole will fulfil with honour the task entrusted to them, of exploring the North Pole."

We have worked day and night to justify the confidence our country has placed in us. We have done everything in our power.

Despite the absence of contact with Rudolf Island our weather reports nevertheless reach Moscow on time. We transmit them via the ship *Murmanets* or the Norwegian radio station on Jan Mayen Island.

In the evening, Eugene, about to leave the tent to carry out meteorological observations, discovered that the exit was blocked with snow right up to the roof. We had to climb out of the tent through the trap-door and, working in the violent gale, shovel away the snow from the exit.

Once again we have failed to contact the "Comintern" radio station; all that comes through the earphones is a deafening crackle as if the blizzard had even penetrated into the radio receiver; we are getting a bit fed up: how are we to live without Moscow?

I played a game of chess with Ernst and, as usual, lost. Afterwards I settled down to my diary.

Peter lay down beside me and went on drafting the plan for the book he intends to write. We were both feeling very hungry, I warmed up the borshch and we had a good feed.

I let Merry into the tent. He was so overjoyed, making a fuss first of one and then of the other of us. In blizzards he suffers just as we do.

January 29. The blizzard has now been raging for three days. The entrance to our tent is again blocked with snow.

We were looking forward to a radio-telephone conversation with the *Murmanets* to-day, but this cursed blizzard has interfered with it.

I am feeling anxious about our food supplies. But in this weather it is difficult to get out to the dumps.

I laid out forks for dinner to-day, but we have so got out of the habit of using them that I put them aside; at dinner we only use the big wooden spoons.

I mended the current-meter; as soon as the gale abates Peter will go out to make current-meter observations.

Eugene was silent and dejected. It is four days since he last took our bearings.

We have drifted a long way, but are unable to ascertain our position.

Peter did not establish the routine hydrological station to-day as the gale continues to rage, and it is too risky to go out to the fissure, and we have no right to take such a risk.

We have no idea what has happened to our hydrological tent and the winch. I wonder if they are still at the edge of the fissure?

Gale velocity has reached 25 metres a second.

The blizzard roars; at times it sounds as if hundreds of heavy planes were flying over the tent! At two paces visibility is nil.

Eugene went out to carry out meteorological observations. He had to find the wind indicator. He passed it several times, but did not notice it until he actually bumped into it.

It is easy to lose one's way in weather like this. Polar workers know what it means to get lost in the Arctic. Moreover, we are constantly aware of the fissures and wide rifts in the ice surrounding us. If any jamming occurs during this blizzard we shall have a hard job to save ourselves. . . . The sledges and the canoe are snowed under, and we cannot get to the food dumps.

Greatly to everyone's satisfaction I noticed that the barometer was rising rapidly—the blizzard should die down soon.

January 30. We are so fed up with the roaring of the blizzard that we try and shut our ears to it as much as possible.

Now and again the roar and whine of the blizzard drowns our conversation, and we have to shout to make ourselves heard.

Ernst contacted the *Murmanets*. This little ship has already reached clear water and is sailing along the edge of the ice.

The voyage of the *Murmanets* is also of scientific significance for, as yet, no one has explored these regions.

Eugene went off to his observatory by the "metro" and settled down to gravitational observations.

I saw that all the lamps were in order, mended the primus, and then cooked dinner.

Ernst left the tent and discovered that the thermograph in the meteorological tent wasn't working. Eugene proceeded to take it to pieces—the mechanism was choked with snow.

In the evening Eugene read us a lecture on gravitation. Our gravitational observations are a very important contribution to world science. Such observations were first carried out in the Polar Basin by Fridtjof Nansen, but they could hardly be called precise or correct: at that time there was no radio and Nansen had no means of checking his chronometers daily, as does Eugene, (twice daily by the signals of Soviet, English and French radio stations).

It is warm in the tent, and condensation runs down the walls. We are lying on wet skins; we shall have to sleep in our oilskins to-night.

How disappointing it is that we can no longer listen to "Latest Radio News"! It is hard to live on an icefloe without knowing what important events are taking place in our country: we are so accustomed to sharing the cares and concerns of the entire Soviet people.

The blizzard cut off our radio contact with Rudolf Island. I imagine they have a large number of radiograms which they are waiting to transmit to us. . . . All four of us are expecting news from home, from our wives, and wondering how they are getting on.

January 31. The gale continues to drive us towards the coast of Greenland.

We experienced severe tremors during the day. The floe is perceptibly quaking and rocking.

Ernst, on camp watch, frequently leaves the tent, but a blizzard is raging and he can see nothing.

Peter took a walk along the fissure which cuts across our camp, but so far has seen no danger signs.

We are still cut off from Rudolf Island.

Eugene has fixed up the aerial: it was essential that he should contact at least one radio station, in order to check the chronometer. Afterwards he started a series of gravitational observations. He completed three series and then had to stop, as the instruments continually recorded the severe tremors of the floe.

I have a feeling that our quiet existence on the floe is coming to an end. Anxious days lie ahead, and we must be ready to face them. We have met with no few dangers in the course of our lives. But we are Bolsheviks, and I hope that we shall be able to overcome the elements.

I crawled out of the tent, fed Merry, then cautiously crawled over the ice to see that our gear was all right. The skis were blown down and snowed under: the sledges were overturned and buried under a snowdrift. Those sledges in which we stored the expeditionary and emergency gear were also buried under a bank of snow.

I called Peter, who came crawling out of the tent, and the two of us set off for the fissure to find out what had happened to the winch.

For greater security we roped ourselves together, taking spades and ice-picks along with us.

Half the way there Peter noticed another fissure; but it was difficult to judge how deep it went. Peter bent down and then said:

"Apparently the floe has been split by the force of the wind."

I pushed my spade down, and sure enough it went right through.

There was no point in our going on—at any moment we might find ourselves cut off from the camp. Even as we stood there the water began to well up through the fissure and flooded a small area of the floe. Soon polynias formed and we realised that the way to the hydrological tent was cut off.

There was nothing for it but to make our way back to camp.

After a short rest Peter went off to find out whether the fissure near the general storehouse had parted.

I cleared the snow from the sledges. The wind beat its way through my fur shirt, snow seemed to penetrate into every pore of my skin. . . . It was impossible to stay out more than half an hour.

I had a game of chess with Ernst.

Eugene studied the data of his gravitational observations.

From time to time we pause in our occupations and listen. Our floe trembles frequently. Involuntarily we glance at the barometer, trying to reassure ourselves with the fact that the barometer is rising a little.

The tremors have become so violent that the snow is sliding off the sides of the tent. We feel as though we are living in a sack which is being violently shaken by a strong and invisible hand.

We sleep in turns: we have to be on the alert all the time!

FEBRUARY

February 1. Ernst and I were playing chess. We had nearly finished the game when we heard a loud crack from somewhere behind the tent. We decided not to stop (I still thought I might win) but when the truth dawned on me that my position was hopeless we started to listen attentively. I wanted to go out and see what was going on in the camp, but Ernst dissuaded me: "Don't go," he said, "You'll only get your clothes wet. . . . I'm on watch, it won't take me a minute to go and have a look. . . ." He went out straight away, had a good look all around the tent but discovered nothing dangerous.

Ernst and I were talking quietly. Peter and Eugene were resting. We turned into our bunks without undressing. The cracking noises grew louder. Soon I heard a strange creak inside the tent itself. I quickly woke Eugene and Shirshov.

"Get your clothes on." I told them. "The ice beneath us is creaking."

Eugene smiled and said:

"Why dress? It's the snow subsiding. The creaking sound is due to that."

I was keen to go out, but Ernst once more dissuaded me, assuring me that he would examine everything himself.

In the meantime Shirshov had already dressed and left the tent, taking a hurricane lamp with him. He soon returned and said:

"The fissure now runs along beside us."

Peter was absolutely calm, making this announcement in the same

matter-of-fact tone in which he would have said, "I've established the station."

The four of us went out to investigate. And there it was—a narrow fissure running along about eight metres from our living-tent. Shirshov examined it and remarked that the edge of the ice was trembling.

We stood there for a few minutes, gazing all around. The blizzard showed no signs of dying down: the gale smothered us with snow.

We returned to the tent and Ernst said:

"First of all we must have some tea."

We discussed a fresh plan of action. Shirshov went off to the fissure once more and returned with the unpleasant news:

"The fissure has widened to five metres, and runs past the storehouse."

Immediatey we all set off for the storehouse. I smashed in the ice roof with my axe, jumped in and found myself standing in water, the storehouse was flooded. At all costs we must save the valuable equipment. We carried it out bit by bit, hauled it over to the middle of the floe and covered it with percale.

Then we walked along the length of the fissure. Eugene brought his magnetic theodolite. Apparently this was not the only fissure. Beyond the far aerial mast we saw a second fissure which cut us off on the east. Under the drumming of the blizzard our icefloe, which had seemed so strong, had fallen to pieces.

We came back to the tent. Now it was dirty and uncomfortable, with percale on the floor, spread over the soft, squelching skins. Bits of wire hung dismally from the ceiling, soaking books lay about. In a corner was a fat bulky parcel—the rubber clipper-boat. Before inflating it we warmed it up.

Ernst turned on the portable gramophone. Whenever times are most difficult or there is any danger he either sits down to play chess or puts on the gramophone.

The windmill groaned under the force of the gale.

"Well, how is it, do you think the wind is dropping at all?" I asked the lads.

They were all listening but said nothing. I warned them:

"Look here, boys; when you go round the camp now, don't go near the edge of the icefloe. Ernst nearly fell in yesterday. Just remember, should anything happen to any one of you, two would be lost, for there would be no sense then in my returning to the mainland."

It is now clear to us all that the floe has cracked and split into several pieces. We are still living under the trusty shelter of our old tent, though we are getting ready at a moment's notice to abandon it: suspicious looking lakes of water are welling up from under the flooring.

We are loading our valuable gear on to the sledges, working at top speed, but endeavouring to take everything, down to the last thread, so that nothing of ours should be surrendered to the ice.

During the day, while we were busy evacuating the storehouses, Eugene caught sight of stars. He was overjoyed and cried out:

"At last the stars!"

For six days, starless, we have been unable to take our bearings. We could not have received a better present on such a grim day.

Eugene computed. Never, seemingly, had we awaited the results of his computations with such impatience.

"Well, come on, what is it, Eugene?" we urged him.

Finally, Eugene announced: "74°16′ North, 16°24′ West!"

At first we found it difficult to believe the figures he had arrived at, but there could be no doubt: in six days the drift had carried us more than 120 miles to the south-west. Twenty miles a day—that's something like speed!

We had to repeat the figures twice before Ernst consented to send them over the air.

And so, we are drifting farther and farther southwards. Despite all the attractions of our "palace" we no longer trust it; at any moment the floe may split beneath us. In view of this probability we decided to lose no time in building new living quarters; snow will have to serve as building material.

The blizzard has abated a little, but the ice is still restless. Suddenly we noticed yet another treacherous black crack—this time along the wall of the kitchen, adjoining the living-tent. At this point the crack broke off, passing under the tent. Beyond the tent, however, it appeared again, running in the direction of the windmill.

There is no room for further doubt: the floe has split beneath the tent!

The sky got a bit lighter towards midday. Meanwhile the fissure beneath the tent was making us increasingly aware of its existence; it seemed to move beneath us. Without waiting to finish building the snow hut we decided to carry the radio station and all the valuable equipment out of the tent, pitch the light silk tents we had with us and camp in them for a short while. The first thing we did was to carry out all the equipment of the radio station; after that the tents, sleeping-bags and clothes.

We have two silk tents, left us by the airmen when they flew back from the North Pole. These we pitched near the far aerial mast: we put the clothing and the sleeping-bags in one tent, and Krenkel's radio station in the other.

Our living-tent was deserted.

The fissure has widened at a disastrous rate: our meteorological tent now stands on the very edge of the newly-formed polynia.

Our wind indicator is on the opposite shore, on the split-off section of the floe, which alternately approaches and recedes from us.

We notified, via the *Murmanets*, the Northern Sea Route Central Administration of the condition of the station.

Peter made ready the canoe.

Eugene carried the gravitational instruments out of his observatory, for that was filling with water also.

The weather reports we transmitted at the stipulated times.

I cooked enough food to last us for four days, as I was afraid the kitchen, too, would soon be flooded. Besides, during the next few days I should be busy building our new living quarters, and would have no time to do any cooking.

We lay down to sleep, leaving one man on watch.

We had a disturbed night; the ice was very rampageous, continually cracking and snapping.

February 2. Peter woke everyone with the words:

"The fissure is threatening the radio tent and is also spreading to our silk tent. . . ."

We decided to have two men on watch.

When it began to get a little lighter I crossed the fissure to the dump, got out all the clothing, fuel and provisions and hauled it on a sledge to our piece of the floe.

Then Ernst tried to establish radio contact, while Eugene carried out the routine meteorological observations and made up the report.

After this Eugene and Shirshov took a sledge and set out for the second dump, which had also been swept away from us. On arriving at the dump, they loaded the clipper-boat and films on to the sledge, and hauled it back to the living-tent.

We also managed to save the equipment at No. 3 dump.

Everyone got very wet.

Then Ernst examined the neighbouring floes: everywhere he encountered broken ice. There is not much left of our icefield! The wind has turned out to be stronger than the ice.

At midday we carefully surveyed the "environs." The inspection gave us small satisfaction; as far as the eye could see there was nothing but broken ice; on our small piece of floe we discovered new fissures, which still further reduce its size. . . . One of the fissures has cut us off from the far aerial mast and the silk radio tent which we pitched yesterday.

There is nothing for it but to move to new quarters again.

Naturally, we want to make use of our windmill as long as possible, and so we always try to have it near at hand; the wind motor is the main source of energy for the radio station accumulators; without the windmill we should have to turn the bicycle. Hastily gathering together all our equipment we hauled it over to the windmill.

Then Peter and Eugene set out for the winch, leaping from floe to floe. They brought the equipment nearer to us. Now we shall keep all our gear on sledges.

The winch was left behind as we could not manage to get it over. It is the first winch in the world by means of which the depths of the Central Polar Basin were measured, all the way from the North Pole. It seems a shame to lose it, but it cannot be helped!

Later Peter and Eugene went off again, to look for large floes in the vicinity. They went north, jumping over the fissures. Every now and then they stopped, climbed the pack-ice, and carefully surveyed the scene.

The whole of the immense field, on which eight months ago multi-engined aircraft had landed, has split into small pieces. Not even a light training plane could make a landing here now.

On their way back to camp Eugene and Peter made a valuable find: one of the reserve dumps, which had split away from us, was drifting among the broken ice. I suggested we save as much of it as we could, load the stuff on to sledges, and haul it back to camp. This we did—Peter, Eugene and I.

Meanwhile Ernst fixed up the radio station on a new spot and resumed contact with the *Murmanets*. After he had sent off a radiogram he started the windmill to charge up the accumulators.

Activated by the desire to rescue as much gear as possible from the drifting dump, Peter climbed on to a huge pile of pack-ice on a nearby floe, and made a survey of the nighbourhood. He spotted two dumps of food and fuel, but it was impossible to reach them as broad fissures separated them from us. However, the floes soon drew closer together and we seized the opportunity to hurry off to our dumps.

We speedily shifted all the food supplies; we performed miraculous acrobatic feats in crossing a broad fissure, and grabbed the sledges which lay beside the hydrological tent; they will always come in useful! The only thing we were unable to save was the winch—a great shame!

It grew dark. I warmed up the dinner, but we were all so tired that we had no appetite. We had a drink of tea and went off to the silk tent to sleep.

I remained on watch for the night. Soon the moon appeared. For us this is a great joy: we are in dire need of light now, as in the darkness it is easy to stumble into one of the fissures.

We have just received a radiogram from Moscow. By order of the Government various schemes have been set on foot to bring us aid.

We are now living on a mere fragment of icefloe measuring thirty by ten metres.

February 3. During the night, through breaks in the clouds Eugene managed to "catch" the Pole-star, Capella, Vega, Arcturus. Afterwards he expressed surprise that during the observations the stars did not move from left to right as usual but in the opposite direction. What could be the meaning of this? It was hard to credit that the earth had all of a sudden started to revolve in the opposite direction. Later, it transpired that our floe was to blame for everything: it was rotating clockwise, and Eugene and his theodolite were rotating with it. Despite this difficulty he managed to determine our position with a fair degree of accuracy.

We woke up before the half-light of the day had set in. Eugene computed the results of his astronomical observations. Our new position pleased us: we had drifted still farther south, which means that very soon we shall see the sun.

We sat in the tent with the primus roaring on the radio-desk, and the lid of the boiling kettle jumping up and down. In short the atmosphere was quite homelike.

I picked up the diary and proceeded to record the events of the past twenty-four hours—and they have not been few. . . .

Since the morning Peter has been putting his scientific data in order, and gathering together all the jars containing water samples drawn in the region of the North Pole.

In the meanwhile Ernst and I proceeded to put the camp in order. Ernst put up three masts for his aerial, which has had to be erected at an angle, as the floe is no longer large enough for the cable—76 metres long—to be stretched to its full length. After this Ernst contacted the *Murmanets*.

We prepared four flares, so that in the event of more jamming, we should be able to light up our own piece of floe.

We had dinner, and finished up with tea and cake.

Over the radio we heard what measures the Government was taking to come to our aid: the *Taimyr* had already left Murmansk; the tiny *Murmanets* was battering her way through the ice; the *Yermak* was undergoing urgent repairs in Kronstadt.

We sent telegrams to our families, so that they should not worry; otherwise, who knows, they might start thinking we might die out here. . . .

We neither worry about ourselves nor our families. I recall the tragic note written by Captain Scott who, returning from the South Pole, was tormented by anxiety as to who would take care of his family if he perished. We have no such anxieties; behind us stands the entire Soviet people, our Party and our Government; with us is our beloved Joseph Vissarionovich Stalin.

At midday I went out and could not refrain from crying aloud with joy:

"The Sun! At last!"

Through the fog, on the horizon the long-awaited red disk was glowing. There was a brilliant sunrise in an orange-tinted sky, against which the serrated ridges of pack-ice stood out sharply.

Ernst and Eugene beamed as they crawled out to greet the sun from the pile of fur clothes they were in the process of carefully sorting out.

Then Ernst glanced at our faces and exclaimed in surprise:

"How rotten you all look, tired out and sallow! One never noticed it in the dark. . . . Do I look as bad as that?"

A blizzard is on the way. Signs of its approach are clearly indicated on the barometer and also from Merry's uneasy behaviour.

Without delay we packed all our gear on sledges, ready for immediate evacuation.

Eugene and Peter packed all their scientific apparatus, which must be saved at all costs, also the results of their scientific investigations, water samples and jars containing "organic life," on to special sledges; we covered them with tarpaulins and lashed them down. After this, Peter set off to get a tin of sausage from the dumps. He crossed three fissures, leaping from floe to floe.

We each had a glass of brandy and a piece of cake in honour of the

sun's appearance. As we were all dead beat we decided to turn in and get as much sleep as we could. Ernst remained on camp watch.

By the way, when I went out to-day I spotted a seal among the ice-blocks, and I fired at it, but missed. I put this miss down to the rifle, so I got a sheet of plywood, stood it up on end, made it fast, and started firing practice shots at it.

I have told the lads that as soon as we have a free hour they must pass a shooting test for sniping: we have plenty of cartridges. This announcement gave special delight to Peter—he is always ready to fire his rifle.

Before dozing off we listened to "Latest Radio News." They spoke of us at length in the broadcast.

It seems the Government is organising widespread operations for our removal.

February 4. The night passed uneventfully, without tremors.

Ernst got the accumulators charged up for radio transmission and scientific work.

After breakfast we put on the gramophone and enjoyed a spell of music. Then we rubbed our faces with a wet cloth, which made us feel a bit fresher.

The blizzard gets us down, chiefly because when we go out our clothes get wet through and we have nowhere to dry them.

Despite this drawback we all set off this morning for one of the neighbouring floes, on which the technical storehouse has been left. We had to leap like cats across the numerous fissures. On arriving at the floe we took everything out of the storehouse, down to the last trifle, and brought it all back on sledges to camp, which now looks like a gipsy encampment, with all our gear packed on sledges.

Our own floe has already cracked in three places. Fissures have also appeared round the edges, and it looks as if we shall soon find ourselves living on a still smaller piece of ice.

We have no worry about contacting the mainland—this is in the hands of our excellent radio operator, Ernst.

I worked with Ernst all day, putting everything in order. After each trip to neighbouring floes to bring back the remaining fuel supplies, we returned to the tent and I put on the gramophone. Ernst would remind me of this task with his usual phrase:

"What about a little relaxation, eh? . . ."

Over the radio we learn that Andrei Alexandrovich Zhdanov has appealed to the workers of the Ordjonikidze Shipyards to complete the repairs to the *Yermak* in the shortest possible time.

The reserves of energy in the accumulators are running low; we are tired out, but nevertheless decided to send short articles to the newspapers; we feel it is our duty to reassure the public. We told them that everything here was all right, that we were living normally and carrying on with our scientific work.

We had dinner in our old tent, but we are keeping the equipment near at hand; after the meal we carried out all the dishes and the primus stoves.

As soon as the gale dies down we must build ourselves a snow hut. We are looking for a suitable site. The problem of space is now becoming acute. Only a short while ago we were rich in territory; we had vast expanses of ice at our disposal. Now we have become so impoverished that we cherish every metre of our tiny floe.

The gusts of wind reach twelve point force; our silk tent shakes violently. Every hour we have to drag the loaded sledges to a fresh place to protect them from snowdrifts. Until now we have been sleeping in the old living-tent, but the time has come to abandon it.

The outside temperature is 11° below zero. After the frosts we have experienced (at times reaching 47° below zero) this is like summer to us.

February 5. The storm continues. We have arranged rest days, as we are afraid of a breakdown. The period which we are now passing through requires not only great moral but also great physical strength.

Ernst is on camp watch, keeping a constant eye on the fissures. There have been no new tremors.

While I was out inspecting the camp I went into our old tent. It is deserted now, as we have moved to our new residence, the silk tent. I discovered a great deal of water had collected in our old home, where we spent eight long months so uneventfully.

We are now surrounded by huge rifts in the ice. Our piece of floe is only a little island; there are even waves lapping its edges.

The dawn began to break at midday. I cleaned the snow from the lobby of the old tent. We are not living there now, but we got so used to this tent, we were so cosy in it during those eight months, that we feel sorry to abandon our old dwelling.

More and more water is appearing all round us. We inflated the second clipper-boat.

We put on the gramophone and for two hours listened to some music, forgetting our dangerous position, the fissures in the ice, and the gales.

I lay down but could not sleep.

The lads have fixed up a barber's shop: we shaved, rubbed our faces with a wet cloth, and became unrecognisable. It is more than a month since we had last washed or shaved. It is a good sign that the lads at such an anxious time are concerned about their appearance; it keeps up the morale.

Shirshov and Eugene have been out on reconnaissance, to find a path to the icefloes where we left our general dumps. As soon as the blizzard dies down we intend to shift our general equipment to the tent.

Now and again through the driving clouds of the blizzard we can make out the first outlines of our dumps.

The moon has appeared. She has grown smaller but still shines brightly. Taking advantage of the moonlight I inspected the camp. I went over the whole of the floe examining the fissures. Now our constant watchword is "Keep your eyes open!" . . .

Ernst missed his step to-day and nearly fell off the floe into the water. I have once again had to issue strict instructions to everyone not to go near the edge of the floe, and have repeated my warning that if any of

them should perish it would be impossible for me to return to the mainland.

It is noisy in the camp: the wind howls, the tent rattles, the aerial whistles.

Eugene has calculated that in 68 hours our floe has drifted 44 miles to the south and 20 miles to the west.

In Moscow they probably refuse to believe that the floe is drifting at such a great speed.

February 6. To-day has been a day of great events.

Ernst who had been on watch woke us.

The jamming of the ice had begun: with a thundering roar floe struck against floe. Banks of ice have sprung up around the edges of our own tiny field. These banks consist of lumps of snow and thin ice formed at the fissures. The nearest bank has been thrown up only ten metres away from the tent.

Each time Ernst made his round of the camp during the night he carefully examined the edges of our floe; we fear that any further pressure will break it up completely. The fissures between the drifting floes are growing steadily wider.

We observed an interesting spectacle: different parts of our camp alternately approached and receded. We saw the food dumps cut off from us by wide polynias. On one occasion the winch, which for some days we had completely lost sight of, floated to within half a kilometre of us. We wanted to go over and fetch it, but were unable to, as it was again carried away.

But we did manage to save the paraffin from one of the dumps. True, this demanded great agility. We had to look sharp; miss the precise moment and the floe with the dump on it floats away.

It seems to us that with the ice as sparse as it is now, any icebreaker could make her way here; the clearings are very extensive.

We did not attempt to jump over to the neighbouring floes to-day, for fear of being carried away and cut off from the camp. This happened to Merry: he had incautiously leaped on to another fragment of ice, which immediately drifted away on the rapid current; we had great difficulty in saving our dear dog.

As the wind has now died down we are building a snow hut.

We decided to transfer the gear from the floating dumps to our piece of the floe, and we got the clipper-boat ready.

Peter again checked the state of the canoe.

We sent detailed information to Moscow on the state of the camp.

Fog is rising. We have erected black flags round the edges of our bit of floe. This is a safety measure for the watches, to prevent them from falling into the water when making the round of the camp.

We have decided not to undress before turning-in, so that when the watch calls out "jamming," we can all jump up quickly and dash out of the tent.

It was very late when we finally lay down to sleep.

Ernst stayed up as camp watch. When he approached the fissure

he got quite a fright: a sea-hare was swimming about in the water; directly the sea-hare caught sight of him he dived with a noisy splash and never showed himself again.

February 7. Another raging blizzard.

We had a tense night: we all slept in our clothes. The ice was again in motion, and the blizzard increased. Our floe is continually rocking beneath us.

The *Taimyr* is already one-third of the way to our camp. At present she is lying-to, riding out the storm.

Also the *Yermak* is preparing to put out to sea.

It makes me proud to think that our dear Comrade Stalin is concerned about us. With so much solicitude for our safety we shall pull through, never fear.

Eugene has calculated that in 24 hours we have drifted 17 miles southwards. And this with the wind not strong. It indicated a very strong current in this region.

The ice has become denser, but it has stopped jamming. We took this opportunity to make further additions to our food supplies: we managed to bring in three tins of food from one of the dumps which happened to drift up to us.

We ate again in our old kitchen. The primuses roared and steam rose merrily from the saucepans. I cooked the dinner. Seating arrangements were a bit awkward, we stuffed lengths of percale and old shirts under us, as the floor of the tent is flooded and one has to paddle about in galoshes.

At the present moment Ernst is in the radio tent. He should soon be returning. We are all giving voice to our longing: perhaps he's managed to contact Moscow? . . .

We know that the *Taimyr* is on her way to us, battling against a severe storm. The *Murmanets* is cutting through heavy ice somewhere near Jan Mayen Island. We have also heard that the Leningrad workers are repairing the icebreaker *Yermak* at great speed. The whole country is hastening to our aid! The thought of this thrills us. We would like to tell our friends on the mainland:

"Don't worry! We can hold out!"

The barometer is falling, and the wind grows more violent. Evidently there are some unpleasant hours in store for us.

I think the radio station should be fixed on a sledge, and that Ernst should operate it on the sledge; if severe jamming were to occur he would have no time to collect and pack the station and there might be a danger of losing it. We take greater care of the radio than we do of ourselves.

Of course, we should have to build a snow hut around the sledge, with walls so thin that in case of emergency we could easily kick them down and haul out the radio.

Bent double, lanky Ernst has come crawling through the tiny tent flap, his trailing hooded deer-skin coat caught up round his waist with a length of rope. The first thing he does upon entering the tent is to stretch

his hands out to the primus to warm his frozen fingers. Poor Ernst as radio operator suffers more than any of us from the frost. He has to work the keys with bare hands.

After dinner I was on watch at the fissure. By the ripple of the water I thought at first that a seal or sea-hare was swimming towards me. . . . But it turned out to be pieces of floe drifting past on which lay spades and ice-picks. Ernst remarked that this floating ice was the remains of our airfield.

I have packed provisions on two sledges and we now have an emergency food supply for three months. But I still do not think this sufficient. But where to get more food? It is all stored away in the dumps which have drifted off on the pieces split off from our icefield.

Peter and Eugene, taking with them light sledges and ropes, have set out to look for our dumps. Ernst tried to persuade me not to allow them to go. I thought it over and then said:

"Off with you, but don't go further than half a kilometre."

They found one dump, got out three tins, and leaping from floe to floe, brough them back to camp. I unsealed one tin, as again enough food to last us for several days has to be cooked.

Peter and Eugene sat down on a sledge to rest. Peter drew out his revolver, stood up a bottle some distance off and fired at it until he broke it.

The wind is growing in violence. Gale velocity has reached 18 metres a second. A blizzard has started.

Ernst contacted the *Murmanets* and transmitted the results of our meteorological observations.

To-day I received two radiograms, one from Volodichka, and the other from my brother Sasha.

The *Murmanets* is icebound. But what a distance the little devil has covered!

It is now seven days since we started our nomadic way of life. But we cannot carry on like this indefinitely: we must build a permanent dwelling.

I crawled into my sleeping-bag for protection from the wind. Before long I was warm and feeling better. . . . The wind tore savagely at the silk tent. As soon as the blizzard subsides a little we must start to build the snow hut.

It is just as well the ice is behaving quietly, and that we can devote all our energies to fighting the wind. And it is no small battle! The blizzard is bent on depriving us of our shelter. Now and again the thin silk sleeping-tent turns into a huge balloon, straining to tear away from the floe. The stronger sailcloth tent for the radio station is torn to shreds. Every now and again our fat inflated clipper-boats bounce violently up and down on the ice. If we had not lashed them to stakes driven into the snow they would undoubtedly have blown a long way off.

February 8. At 1 a.m. I took over the watch from Eugene. As soon as he crawled into his sleeping-bag he fell asleep soundly, despite the howling gale.

A terrible storm is raging. Several times the gusts of wind overturned the loaded sledges. At any moment, it seemed that our tent and the radio station would be blown away.

It was far from a quiet watch; I was continually putting the sledges straight and securing the radio tent.

Later Ernst relieved me. I had taken off my hooded deer-skin coat, and was just preparing to crawl into my sleeping-bag when suddenly Ernst's voice, filled with alarm, yelled out:

"Quickly, come and help! The storm is smashing the radio tent!"

I was the first to jump to my feet; I seized my deer-skin coat but the wind tore it out of my hands and blew it into the fissure; I had great difficulty in retrieving it. Putting it on, I started to run to Ernst's assistance. Eugene, too, came running up. Lying flat and sometimes kneeling (the wind was too strong for us to stay on our feet) Eugene and I held on tightly to the canvas which was straining away from our hands, while Ernst crawled inside the tent and packed up the equipment of the radio station. When he crawled out we pulled up the few remaining pegs and that was the end of the tent.

We piled heavy trunks, bales and cases on the edges of the billowing sailcloth.

At the time it seemed impossible for the wind to reach a greater velocity.

There was still a long way to go till dawn.

Peter examined the floe and announced that as yet there were no new fissures or pack-ice to be seen. We went off to rest in our old living-tent.

Eugene tried to get to sleep in the silk tent, huddled up in his deer-skin coat, but without success. The snow which had blown into his coat melted. Despairing of sleep, Eugene started to mend his clothes. He says that we have again drifted a long way southwards; the proof of it was the comparatively early dawn.

We went out of the tent, and sure enough it was getting light. With the appearance of daylight we cheered up a bit.

The wind was not quite so fierce. We reckoned up our losses. The radio tent had been smashed; the wind was blowing wet snow into the living-tent, which did not look as if it would hold out even till evening. The sledges which were loaded with clothing were upset and lying on their sides.

We decided to start straight away on building the snow hut. We must move into the new premises to-day, without fail.

So we armed ourselves with tools—spades, saws, ice-picks—and then proceeded to cut bricks out of the snow. The work went with a swing. Ernst and I cut out bricks while Peter and Eugene put up the walls. By the time we had the walls finished the sky had become much lighter.

First we drew a plan of our future home, and kept to it strictly. A considerable part of our new residence is being set aside for a dormitory. This takes the form of a low bench made of snow and running the whole length of the hut. The rest—the floor and the table—were also made of snow.

After building the walls we placed poles over the top on which we stretched the tent, covering the whole with a square of canvas: this formed the ceiling. We closed the entrance with a flap of percale. Such were the simple arrangements of our "snow palace."

When the sky grew lighter Ernst cried out in great excitement:

"Land, land!"

We all turned and stared in the direction to which he was pointing, and there, sure enough, we saw high mountains. For the first time, after a drift of nine months, we saw—though still far away—terra firma; we could see the sharp needles of the mountains of Greenland. We all shouted "Hurrah!"

From then on all our talk and all our thoughts revolved around the mainland. How we longed to feel the touch of our native land; to set foot on it! What a pity the sky was overcast making the coastline of Greenland so hazy.

The gale has at last subsided. After the terrific convulsions we have just experienced, the snow hut seems a comfortable and even spacious "palace." We had supper in the hut, all the while praising our new home.

It was time to turn in. Eugene, before indulging in his long-awaited rest, left the hut and made another astronomical determination. The moon shone brightly through the thin cloud, lighting up the pack-ice surrounding our floe.

We had a snack before turning-in, and then proceeded to crawl into our sleeping-bags.

Eugene stayed on watch. He went out and had hardly taken a few paces when he saw as clearly as if it were day, three bears a short distance away from him. He ran back and woke Merry with a light kick. Startled, the dog rushed towards the bears barking furiously.

"Dmitrich! Boys! Get up. Some bears have come to see us!" shouted Eugene.

Ernst refused to believe it, and shouted back angrily:

"All right, all right. Don't worry me!"

"Hurry up and come out! I swear there are bears!" repeated Eugene earnestly.

At this I dashed out of the hut with only my fur stockings on. And sure enough, there were the bears quite close.

As usual our loaded rifles stood by the entrance. Eugene quickly handed me one, whispering: "Fire, fire!"

This time I killed all three bears with several shots.

Luckily Merry was unhurt, though he was dashing in and out among the bears the whole time, getting right in my line of fire.

This was my first successful shot in nine months.

It took Eugene and myself till about 1 a.m. to skin the bears. Ernst was unable to help us as he had to carry out the nightly meteorological observations and transmit the weather report over the radio. He offered to help, but we would not allow him to soil his hands.

We are all delighted at the successful bag—we can have fresh meat at last!

Thus, to-day has been full of unusual events: the storm has died down, we sighted land, built ourselves a snow hut and killed three bears. . . .

It is a pity that we have no reliable radio contact with the mainland. We can well imagine how anxious our families must be about us! Still, in the morning we shall fix up the radio station without fail, and be able to tell them that we are alive, well, and carrying on with the scientific work.

February 9–10. We have had fine weather for two days now. The night was quiet and uneventful. The moon is shining and in the moonlight the ice glitters. The stars are clearly visible.

Eugene announced our new position: 72°6′ N. Lat., 19°30′ E. Long.

In two days we have travelled 57 miles. Whoever would have dreamed that the floe would drift so rapidly!

Throughout the night Eugene was on camp watch. Now Peter has relieved him.

We are taking advantage of the fine weather to put our camp in order. Yesterday Ernst and Peter firmly lashed all the radio apparatus to the sledge—the transmitter, accumulators and distributors were fastened down in such a way as not to interfere with their use. Now we need not dismantle the radio station or switch off when shifting it to a new spot.

Eugene and Peter have brought in two more tins taken from pieces of our icefield which had broken away during the pressure. Now we have collected on our greatly reduced floe a reserve of food and fuel sufficient to last us nearly five months.

The ice continues to behave. The fissures are now frozen over with new ice, which to some extent binds all the floes into one large icefield.

The mountains of Greenland now stand out more sharply and clearly. Through the field-glasses it is possible to see distinctly individual cliffs and ice precipices.

To-day I took a photograph of the camp.

We have built a snow hut for the radio station: it was very hard for Ernst to work outside in the wind. The sledge with the radio equipment is easily accommodated in the hut, and can be pushed out of it by breaking down the front wall, which is made of very thin slabs of snow.

Eugene has again carried out magnetic observations.

We had a very satisfying dinner to-day. The lads lay on the bench in the snow hut, sniffing the appetising aroma of fried bearsteak. I cooked a huge panful, thinking it would last us about three days. But the lads gave me no peace:

"Give me a bigger helping, Dmitrich! . . . More. . . . As much as the plate will hold! . . ."

We ate the fresh meat with tremendous relish, and soon the pan was empty.

"You certainly know how to cook bearsteak!" said Peter.

"What did you expect?" I asked him.

"Well, you see—in 1935, on the *Krassin* they always fed us on bear's meat, and I got heartily sick of the stuff," explained Peter.

Peter's appreciation of my cooking gave me great pleasure. I never thought I would make a good cook!

The outside temperature is 19° below zero, in the hut it is 12° below. It is cold, of course, but then our clothes keep dry. Moisture gets us down, as we have nowhere to dry our fur suits.

The barometer is rising, which is cheering: perhaps Dame Nature has decided to give us a short rest.

I told Peter that, in accordance with the promise I made him some time ago, I would present him with the skin of one of the bears I had shot.

We have been informed by radio that the *Yermak* is in the Kronstadt roadstead, and will put to sea in the evening. Is it possible that our floe will shortly enter a region in which the *Yermak* can approach us? But we have no airfield for a plane to land; only fragments of icefloes!

Peter says that the ice is beginning to freeze together. Perhaps a large icefield will form, which we could clear and turn into an airfield. It would be difficult, however, for the four of us to do a job as big as this.

The icefloes continue to freeze together. As far as the eye can see no water is visible. The entire mass of ice is drifting without any disturbances.

Eugene determined our new position. He says we have drifted another ten miles.

Peter was on watch to-night. The moon shone brilliantly; visibility was so good that Peter could even make out the coast of Greenland. Towards morning Ernst relieved him. Soon after, I, too, got up and cooked the breakfast.

Ernst called the icebreaker *Taimyr* by radio. We are glad that a Soviet ship is approaching us; perhaps with the help of her radio operators we shall be able to improve contact with the mainland. The *Taimyr* informs us that she is still lying-to in a severe storm belt. The captain has decided at the first opportunity to lower a plane on to an icefloe and start a series of flights to our camp.

We shall now maintain regular contact with the *Taimyr* until the *Yermak* comes up. Ernst cannot keep in contact with all the ships as we have only a limited supply of electrical energy. Besides, Ernst has to work outdoors: he comes in every ten minutes to warm his numbed fingers. If he forgets to do this in time, later on he has to spend a long time rubbing his hands to bring them to life.

Ernst contacted the Moscow radio stations. The forecasters prophesy good weather. But a prolonged calm won't suit us; our windmill won't function, and our radio contact depends on the windmill.

When we returned to our hut after work we found a thick layer of hoar frost on the sleeping-bags; this is again caused by the condensation of our breath.

I played chess with Peter and Ernst. Though the cold was so intense that our fingers frequently went numb, we nevertheless played two games.

Later Eugene made an astronomical determination and I helped him, making the calculations with the chronometer.

I lay down to sleep. Ernst woke me and told me he had again contacted Moscow, and learned that the *Yermak* is making for our station at top speed. We are very excited to hear how well our Motherland is looking after us.

Eugene and Peter have gone to look for a suitable spot for a landing ground. They strapped on their skis and set off in a south-westerly direction. The ice over the fissures has now become strong enough to stand the weight of two men. There was no ice movement that they could notice.

Every half-kilometre or so Eugene and Peter climbed on to a hummock and carefully surveyed the surrounding locality. They spotted a level space near one ice ridge: the dull white layers stood out clearly among the broken ice glittering in the rays of the sun.

The lads lost no time in reaching the level space. I should think it must be a big polynia freshly covered with new, comparatively thin ice.

Not one single snow ridge mars the ideally level surface. The ice here is at least 30 centimetres thick.

Eugene and Peter were overjoyed at their find, they went out to the middle of the field and paced and measured it with their strides in all directions.

We believe that the light planes which the *Taimyr* is carrying will be able to land on this field. What luck!

The lads returned by a different route, in order to examine the region lying east of the camp. However, they failed to discover a better field.

February 11. In an absolutely dead calm we have travelled eight miles southwards.

Eugene made some cocoa and heated up the buckwheat porridge. We all had a solid breakfast.

Again we have failed to contact the *Murmanets*. This worries us; perhaps something has happened to her. She was very bold in making her way deep into the icefields far away from the edge of the ice. In a wooden vessel this is not without its dangers.

Ernst busied himself examining and repairing the windmill charging plant, cleaning the distributor, the collar and the vanes. After that, Ernst and I set off to examine the ice in our region. It presented a wonderful picture! We gazed at the distant panorama of the forbidding coastal cliffs of Greenland with their glaciers; at the huge lumps of ice frozen together, just as if they had been put through a giant mincing machine. It would be nice if the floe drifted nearer to the coast; then we should be able to photograph the mountains of Greenland.

When we returned to camp Ernst contacted the radio station on the *Taimyr*. In the meantime Eugene and Peter had returned from reconnaissance. They, too, are lost in admiration of the Arctic landscape.

A Danish radio station has again offered us its services, but Ernst declined them with thanks.

The barometer is falling steadily. Apparently we are not allowed a long rest; soon, evidently, the wind will start up again.

After playing a game of chess with Peter I sat down to write up the

diary. With 22 degrees of frost it is difficult to hold the pencil in one's fingers, but I force myself to do it: one must be strong to the end and write down everything that happens.

Over the radio came the announcement that cameramen have been sent to Sevastopol to make a film of the life of my family—my father and brothers—I wonder whether the hovels in which I spent my dismal childhood are still standing, for in Sevastopol, as in so many cities throughout the country, extensive building is going on. Cameramen have also been sent to Dniepropetrovsk—to Peter's birthplace.

The moon has begun to conceal herself from us; clouds cover her face. This is very disappointing as we find it difficult to work without the moon. On the mainland they say that only lovers need the moon. But out here we need her more than all the lovers in the world.

February 12. The night passed without a breath of wind. In the morning Ernst got us all out of our bags with the shout:

"Light on the horizon!"

I doubted the truth of his statement; even so, I crawled out of my bag. The trouble is that similar calls of "Light on the horizon" have already confused us three times, and each time it has turned out to be stars low on the horizon shining through cloud gaps.

"But stars can't shine for an hour and a half in the same spot!" Ernst assured me. "I've been looking at this light for a long time, but was a bit doubtful about it and reluctant to wake you. Just have a look, Dmitrich; now, I believe, after all, it's the *Taimyr's* searchlight."

Peter and Eugene woke up. We crawled out of the hut and saw a light in the east. Eugene drew his theodolite on it and declared:

"That's no star."

Until now we could only visualise as dots on a map the ships which were cutting their way towards us. How comforting it was at the moment to see the actual beam of a ship's searchlight!

The *Taimyr* seemed to sense our feelings, and started playing her searchlight on the horizon.

Ernst informed the icebreaker by radio that we could see her light. Our announcement aroused general exultation among the crew.

"We've a fine ship, she's very strong," the captain informed us over the radio-telephone. "I hope to get still nearer to you. So long, we'll be seeing you soon! . . ."

We told the *Taimyr* that we would light a beacon in the evening, which she was to answer with her searchlight.

Ernst and I climbed to the top of a high pile of pack-ice, hoping to see the *Taimyr's* smoke on the horizon. I asked Peter and Eugene to go off and look in the opposite direction. . . . But we none of us saw any smoke.

The *Yermak*, as the radio has informed us, is cutting her way through the ice in the Gulf of Finland.

I began to cook the dinner on the primus, but the burner went wrong, so I finished my culinary efforts over the blow-lamp. During dinner we grew warmer and calmer. Previously we had all been shivering with cold.

As pre-arranged with the *Taimyr*, I lit a beacon by tying a flare to a steel rod; Peter climbed the highest pile of pack-ice to see when the *Taimyr* put on her searchlight. We had not long to wait—a minute later a brilliant light flooded the horizon.

We were blinded by the magnesium; the flare dangled on the rope tied to the rod; I waved the rod above my head and the bright flame, roaring upwards, emitted cascades of sparks. The *Taimyr* saw our signal clearly.

This was our first communication by light signal, with the first Soviet ship to come to our aid. The crew of the *Taimyr* was very bucked about this.

In the evening we listened to "Latest Radio News." My father and brothers intend to travel to Moscow to meet me.

We sat a long time over tea, talking about our remaining days on the floe. We were all in good spirits and cheerful.

Only out here, on the floe, have we learned to appreciate the special delights of tea. We drink it five times a day; the only thing that gives us warmth. We often say that we could kiss the person who invented tea!

A breeze has sprung up, the fog is getting worse.

February 13. At 5 a.m. I woke Eugene, and he relieved me of the watch. I crawled wearily into my sleeping-bag, but it was a long time before I could get to sleep, I was chilled to the bone. As soon as I managed to get warm, however, I fell asleep.

I soon woke up; I felt reluctant to get out of my bag, and drank my morning tea in bed.

We are feeling the cold terribly. We swear that if by the end of this month the *Taimyr* is unable to remove us we will definitely set to work on making the hut warmer by adding a second roof, as well as a second flap to the entrance.

Ernst refuses to stay in the hut, instead he walks about the icefloe all the time, trying to get warm.

The *Taimyr* has already found an icefield from which planes can take off. The pilots propose to carry out air reconnaissance on the first night the moon shines.

Krenkel warmed up the dinner.

Visibility has improved; we have sighted the coast of Greenland. Apparently our floe has drifted still nearer to it.

We discussed the plan for our scientific report when we returned to the mainland.

During the past few days we have all been in festive mood as the wind has dropped and peace reigns.

We continue transmitting the weather reports regularly.

February 14. A violent gale is blowing. Krenkel has had to strengthen the roof of his radio station and our snow hut. I brought in everything lying out on the snow and lashed it down, as on the deck of a ship in storms.

Eugene and I took our bearings. By midday we knew our position: in two days the floe had drifted 17 miles.

Ernst contacted the *Taimyr*. The members of the crew had been working throughout the night, clearing the airfield, and assembling the plane. They ask us, too, to prepare our airfield.

Peter, Eugene and I got out the tools and hauled them on sledges to the airfield. Ernst remained behind in the camp with instructions to light a beacon so that the *Taimyr's* airman could tell the direction of the wind by the smoke.

We made our way with difficulty to the frozen polynia. It was very hard going over the unending ice hummocks.

Later, I decided to return to camp and find out whether the plane had taken off. I arranged with the lads that I would hoist one flag if the take-off had been cancelled, and two if it was taking place.

The *Taimyr's* radio informed us that the wind was breaking up their airfield and that the crew were hastily reloading the planes on deck. Not only this, clearings had appeared in the ice, and on board the *Taimyr* they thought the ship might be able to break through nearer to us.

I hoisted one flag. Shortly afterwards Peter and Eugene returned. Ernst then told me what had occured while I had been at the airfield.

During our absence Ernst proceeded to light the beacon, as arranged; he set fire to a few boards over which he poured what he thought was paraffin. But what he had got hold of was a tinful of benzine. As soon as the benzine splashed on to the fire it burst into flames and the tin was blown out of his hands. . . . Ernst got off lightly. It doesn't bear thinking about: he was left alone in camp and might easily have been burnt to death.

Towards evening the gale subsided again. The moon is shining and there is a magnificent display of the Aurora Borealis.

February 15. Ernst heated the soup made from bear-cub meat and fried some rusks in butter, which we had with our tea.

We listened to the morning edition of "Latest Radio News." We heard that important foreign newspapers had printed leading articles about our expedition; foreign countries are displaying great interest in the work of our station.

Eugene took our bearing. In 24 hours—in a dead calm—we had drifted nine miles. Our position is 71°13′ N. Lat. and 20° W. Long.

On board the *Taimyr* fresh attempts are being made to send up reconnaissance planes. Pilot Vlasov is impatient to take-off and survey our region. The aeroplane is all ready and the engine running.

We set off for the airfield, leaving Krenkel in camp. . . . We had barely arrived at the airfield, and recovered our breath after leaping from ice-block to ice-block, when Peter heard the droning of an engine. Hurriedly we started putting up the flags. I climbed on top of a huge pile of pack-ice, and raked the sky with my field-glasses, but was unable to spot the plane. Meanwhile, Ernst had lit a beacon. We waited and waited till we were frozen through; then we started firing off our revolvers. At last after the fourth shot Krenkel let the fire down. Again I heard the distant drone of an engine, but could see no sign of the plane. Finally, we realised that pilot Vlasov had failed to find our floe.

Ernst contacted the *Taimyr* by radio and was given the full information. Airman Vlasov had taken off twice on reconnaissance, but could not spot our camp and, finding himself in a thick cloud bank, made a landing near the ice-breaker *Murman*. The airman Cherevichny, from the *Murman*, had also taken off on reconnaissance but had not yet returned.

The fog grew denser and we all assembled in the camp. We settled with the *Taimyr* that she should not hurry and try to do the impossible, but to look out for clearings in the ice. It is essential to get all our precious gear safely off the floe: every trifle on the North Pole Station will be treasured by the Arctic Museum. The ships must try and come as close in to us as possible; our transfer by plane will be a lengthy and difficult operation, and entail a certain amount of risk.

There is only half a degree of frost to-day, and sleet is falling. The walls of our snow hut are melting rapidly. Water drips from the canvas ceiling on to the sleeping-bags. Our hooded deer-skin coats and fur overalls are wet through. They appear to have absorbed a great deal of moisture, but in frosty weather they become stiff, and hence we do not feel the dampness.

February 16. The pilot Cherevichny, who took off from the *Murman*, has not yet returned to the ship. He must have made a forced landing somewhere. This morning Eugene and Peter asked my permission to go and search for Cherevichny, but with the fog growing denser every minute, I absolutely refused to allow the lads to go off on such a risky expedition.

The temperature is rising: water continually streams down the walls of our hut. We have to sit down to dinner in our oilskins, but even these don't afford us much protection—water drips down on to our heads from the canvas ceiling, and runs down inside our collars.

The *Taimyr* has again informed us by radio that Cherevichny has not yet returned to his ship. This is causing us great anxiety. The weather cleared a little at midday and I allowed the lads to go and search for Cherevichny's plane. Eugene fixed up the cine-camera and he and Shirshov set off in an easterly direction. I stood by the tent, following them through my field-glasses.

Suddenly I heard the roar of an engine, and shouted out joyfully:

"Ernst! a plane!"

Krenkel immediately lit the beacon.

Vlasov's tiny plane appeared high above the camp. I brought out the camera and took shots of it. Vlasov circled over us twice and then headed for the airfield.

I went racing off to the airfield, which is two kilometres away. But before I had run one kilometre Vlasov had already landed.

The pilot climbed out of the cockpit and came to meet me.

It is hard to describe the intense emotion we both felt on meeting. We met half-way, threw ourselves into each other's arms, and hugged each other. Neither of us could speak for emotion. I laid my head on his shoulder to recover my breath, but Vlasov thought I was crying. He raised my head, saying:

"There, there! Take it easy."

And I answered:

"It is nothing, nothing. . . . Why are you so excited?"

Thus we stood looking at one another for several minutes, speechless with delight.

Then we walked back to the airfield, where Navigator Dorofeyev had been left, and I embraced him also.

Meanwhile Vlasov climbed into the cockpit of the plane and brought out a case of tangerines and some beer.

"A present from the men on the *Taimyr*," he said, smiling.

I thanked him warmly, then he handed me a packet of letters from my friends on the staff of *Pravda*. This was our first mail since the day we took off from Moscow.

Vlasov told us that he discovered our camp quite by chance. He was out on a search for Cherevichny's plane, and in the distance he sighted our position.

I had no wish to hold up Vlasov's plane. The engine was ticking, and night was coming on. Though I must admit, I was loath to let go a man who had so recently been in Moscow.

Vlasov suggested that I should assemble the camp equipment prior to our transfer to the ships by plane. I refused emphatically, declaring:

"Until you find Cherevichny you are not to make a flight to our camp!"

He smiled and said:

"I promise you, Dmitrich, I shall find Cherevichny. I give you my solemn oath!"

Then we embraced once more and I parted from him and Dorofeyev with great warmth.

And a few minutes later the plane was in the air.

All of a sudden a feeling of such weariness came over me, that I longed to sit down. I walked over to an ice-pack and I sat down; I took off my fur shirt and waistcoat; then I got up, flung them over my shoulders, and picking up the case of tangerines and beer slowly made my way back to camp.

On my return I told Ernst about my meeting with the airmen. Soon Eugene and Peter came in: their search had been in vain. They had been deceived by a black dot which they sighted in the distance. But when they got closer they discovered it was the winch which had been carried away in the recent ice jamming.

Before Eugene and Peter's return Ernst and I had decided not to tell the lads that we had been brought a present until after dinner, when we would bring out the tangerines and beer as a surprise.

Quite casually as it were, I mentioned in the course of our conversation that it would be nice if we had a glass of beer, or a tangerine instead of pudding. Peter laughed and said:

"I'll say it would be nice! But we'll have to wait till we get to Leningrad."

Eugene somehow sensed straight away there was something suspicious

in my talk, and he ruined my little plan by feeling our sleeping-bags where, of course, he discovered the beer-bottles. . . . After drinking the beer we proceeded to savour the tangerines.

In the evening, over the radio, the officers of the *Taimyr* suggested that our camp should be transferred to the ship by plane. I refused categorically, and again repeated:

"You must look for Cherevichny first. Until you find him there's no need to fly over here."

To-day Eugene ascertained by his instruments that the floe was pitching. He thought the pitch was caused by the swell coming from the east.

The outside temperature is now 15° below zero, and the moon is shining brightly.

I am very concerned about Cherevichny: I wonder if he has any food with him, or warm clothing? Or a rifle? . . .

February 17. During the night lighting their way by searchlights the icebreakers *Taimyr* and *Murman* made some headway. To me, they seem already quite close. Numerous flares are being sent up by the *Murman*.

I turned in for a sleep, as I had been on night watch: Ernst relieved me. It was a long time before I could drop off: my underwear was still damp from my trip to the airfield. I asked Ernst to put an extra cover over me; he gave me his deer-skin coat.

To-day we have left the 71st parallel. If we drift for another 59 geographical minutes the total length of our drift on the floe will be 20° of latitude. This is a great distance, bearing in mind the special conditions of the Central Polar Basin.

We lay in our sleeping-bags, discussing the result of our drift. It is pleasant to think that everything we planned a year ago has now been realised. True, life brought much that was new and unexpected in our plan. In particular, our drift turned out to be swifter than we had anticipated.

One of the most interesting subjects of our scientific research has been the study of the movement of the ice covering the surface of the Arctic Ocean. The speed of our drift varied: at times we practically stayed in one spot, at other times we travelled at a speed of 43 kilometres a day. Our drift was particularly rapid in the later period, since the floe entered the Greenland Sea.

Resting as we now are, we speak of this as if it were a matter of the past.

We shall certainly be able to answer many questions in which science is interested. What causes the movement of the ice? A provisional study of the data obtained by Peter and Eugene from their observations reveals the following picture: the ice drift is caused by two forces. One of these forces is the wind. The second is to be found in the ocean, which drives the ice southwards regardless of the direction of the wind.

What is this second force? The simplest explanation of it would be to presume the existence in the central part of the Arctic Ocean of a surface current drawing the ice southwards, to the coast of Greenland.

The observations of our young scientists Peter and Eugene, however, have shown a reverse picture: it is not the current that draws the ice, but the movement of the ice which draws the upper layers of the water.

Apparently the general weather cycle in the Central Polar Basin determines the predominance of north or north-west winds. These winds force the ice to move towards the Greenland Sea, where it is caught up by the swift so-called East Greenland current sweeping in from the north.

We are able to confirm this deduction by the data of the observations which Shirshov conducted with the aid of the current-meter.

We now recall the difficult days of working the winch, in order to take the depth-soundings. What results did we obtain from these soundings? They enabled us to draw a relief map of the bed of the North Arctic Ocean from the North Pole to the Greenland Sea.

Shirshov established that from the Pole to 86°40′ N. Lat. our floe drifted over a deep valley with a very sloping bed. Here the maximum depth reached 4,400 metres. Then the bed began to rise, and irregularities appeared. When we reached 83°56′ N. Lat. we found an underwater elevation beneath us. Later the depth again increased: we drifted over deep hollows situated only 40 miles from the north-east foreland of Greenland.

We had crossed the so-called "Nansen threshold."

It was presumed that between Spitzbergen and the north-east foreland the sea bottom was considerably elevated. Scientists held that this was the threshold separating the Arctic Ocean from the Greenland Sea. Shirshov established that the depth of the ocean in this region was 1,420 metres, and in the central part of the strait it is, undoubtedly, still greater.

We established thirty-eight hydrological stations.

Investigations proved that Atlantic waters penetrating to the Arctic Ocean through the broad gate between Greenland and Spitzbergen reach the Pole and spread through the Central Polar Basin. At all the hydrological stations, under a thin layer of cold Arctic water, Peter discovered a layer of warm Atlantic water.

Fedorov's observations are of great value to science.

And now our expedition on the drifting floe is coming to the end of its work.

Peter and Eugene left the tent but soon returned, and told me they had decided to go out on reconnaissance, to search for Cherevichny's plane.

Again I followed them through my field-glasses.

In "Latest Radio News" a letter was broadcast addressed to me from the workers at the Onega factory, telling me how proud they are of our work on the floe. They declare that the North Pole Station will bring glory to the Motherland, and urge us to continue to justify the confidence of Comrade Stalin.

As I listened to these last lines of their letter, I mentally answered the workers: "Of course we shall; never fear!"

Ernst has just contacted the *Taimyr*. She reports that Vlasov has

found Cherevichny and brought him back to the *Murman*. Also, during his flight Vlasov discovered wide polynias and has plotted the course for the ships to take in order to reach our camp.

I hoisted the flag, as arranged, for this good news had to be signalled to our scouts, Eugene and Peter.

Shortly afterwards the *Taimyr* informed us by radio that Vlasov had intended, after finding Cherevichny, to fly over to our camp again to tell me he had kept his word; on his way, however, the weather changed for the worse, and the pilot ran into dense fog, so he turned back and made a landing on a tiny icefloe near the ship.

No signs of our scouts as yet. I wonder where they can have got to?

The wind had risen and I grew anxious. But then Ernst sighted our lads in the distance returning to camp. My heart grew lighter. I'll never let anyone go off on these trips again.

Shirshov came in feeling a bit sore:

"What's the idea of hoisting the flag if there's no emergency?" he grumbled.

We had arranged to hoist the flag only in the event of an emergency in the camp. Up till now we had had no need to use this agreed signal, for in times of crisis we have always been together. This time, however, it was the only way of getting the lads back from their search quickly.

Eugene and Peter described their expedition. They saw a number of floes suitable for landing grounds. At some distance from the camp they found traces of our equipment: torn lengths of percale, boards, and various oddments.

Our scouts were dead beat and turned into their bags, falling asleep immediately.

February 18. Eugene relieved me of my watch. He took advantage of the re-appearance of the stars to take our bearings. Our new position is 70°54′ N. Lat. and 19°50′ E. Long.

We all slept badly last night. The strain of the last few days is beginning to tell. I played a game of chess with Ernst. Later we left the tent together, I took my binoculars with me and started to scan the horizon. All of a sudden I saw a trail of smoke and soon after sighted the masts and funnels of a ship. I called the lads, shouting:

"Come here! I can see a ship!"

I lit the beacon and hoisted the flag on a pile of pack-ice. As the ship is already approaching our floe it means we shall soon be among our own people!

We listened to "Latest Radio News." Evidently our work is being highly appreciated abroad. The newspapers report that "the great drifting expedition in the Central Polar Basin is drawing to a close."

We have calculated that the ships will soon move into clear water and be able to moor at the edge of the ice about two kilometres away from our station.

Peter and Eugene proceeded to shave. In their hurry they cut themselves, Fedorov suffered the most. Krenkel and I decided to postpone shaving till morning.

We assembled in the tent and drafted a radiogram to Comrade Stalin, the leaders of the Party, and the Government, to be transmitted when we abandon the floe.

In the evening we saw two brilliant searchlights from the ships.

At 1 a.m. Eugene computed that we had drifted 7 miles to the south.

We lit a big beacon. The *Taimyr* sent over a radio message saying they could see our fire distinctly. They are in high spirits!

Decisive hours lie ahead: we shall soon bid farewell to the floe which has carried us so faithfully for nine long months. Although the icefield has broken up during the last few days even the remaining fragment has served us well. We all think affectionately of our chilly floe. . . .

I must admit, I did not like the idea of being removed from the icefloe by plane: you cannot take a big load on a plane, and we had decided to bring back every bit of equipment with us, even down to the remaining food supplies.

Our radio station is especially dear to us. Meteorologists and weather forecasters the world over have reason to be grateful to it: four times daily by means of this radio station, we transmitted weather reports from the Central Polar Basin.

Eugene and Peter inspected and lashed down the sledge on which we had loaded the results of the scientific work on the North Pole station. This cargo we guard as we would our very lives. Ernst says jokingly that all the secrets of the Central Polar Basin are piled on this sledge.

A detailed map of our drift will be drawn on the basis of our scientific observations. We feel confident that the results of our hydrological work will help scientists to forecast the conditions of the ice.

We also know that on the basis of the data we have obtained, a chart of magnetic declinations in the region through which we have drifted will be drawn up; this will assist airmen in trans-arctic flights from Europe to America.

It won't be long now before we see our beloved Motherland, when we can say:

"Our duty to the people has been fulfilled, the task set us by Stalin has been carried out!"

February 19. This is the last day of the North Pole Station.

I shall never forget these last twenty-four hours.

Yesterday we didn't eat our supper—we were too excited to swallow! Moreover, I had cooked an indifferent dinner: it was one of those occasions when the cabbage soup and buckwheat porridge turned out badly and we hardly touched either dish. The saucepans containing the last meal cooked by us on the floe were left standing on the table.

At 1 a.m. Peter came on watch—it was his turn for camp duty. It was supposed to be my day off, but I was unable to sleep and anyway I disliked the idea of leaving Peter all by himself on a night of such intense strain; so I sat down to play chess with him. Every half-hour we went outside to see if any more of our floe had broken off.

Our floe is now only 30 metres wide. Moreover it has cracked again in four new places. We make regular inspections of the fissures, so that

in case of pressure we should be able to haul out our precious cargo, which is loaded on sledges.

This morning everything proceeded as usual: Eugene carried out meteorological observations, Ernst transmitted the weather report to the *Taimyr*, and I lost four games of chess to Peter.

Later we went out and were greeted by the beam of a searchlight piercing the sky. Soon the beam began raking the horizon; they were evidently trying to find us, but could not.

We climbed the nearest hummock. On the way I picked up a tin of benzine. Quickly tearing off our fur waistcoats we soaked them in the fuel, hoisted them on top of sticks and set light to them. Twice we lit a bonfire of rags; old furs and felt boots soaked in paraffin. It burned magnificently, red tongues of flame leaping high into the sky.

Merry behaved badly in the night. As soon as the silver beam of the searchlight pointed in our direction he set up a furious barking. My nerves were so taut that I could not stand it; I seized Merry and squeezed him tightly between my knees, and he stopped. But as soon as I let him go he rushed off to the neighbouring floe and there, feeling himself quite safe, started barking again, and kept it up until the searchlight went out.

At 6 a.m. Ernst took over the watch.

Stars had appeared in the sky and Eugene took our bearings.

I only slept three hours, but I woke feeling refreshed; except that my heart was beating irregularly; now and again it seemed to stop. At midday I was just about to start meteorological observations, when I received a radio request from the ships: "Send up flares, light beacons."

I was indignant: all night long we had been burning benzine and paraffin, and they still called for more light:

"Where do they think we are, Baku?" asked Ernst, disgruntled.

Nevertheless we lit more beacons.

At 1 p.m. the ships' funnels started belching black smoke; they were quite near by now.

I decided to tidy myself up. I started to shave, but my hand shook with excitement. . . . I cut myself and drew blood. I looked at my face in the mirror: horror! We hadn't washed since New Year's Day! My hands were like a chimney-sweep's. I tried to rub the dirt off them with snow, but only rubbed it in the more.

At 2 p.m. the ships reached the edge of the ice, and moored alongside. Through my field-glasses I could see men hurrying to land on the ice.

I could not restrain my emotion, I turned aside, and tears of joy ran down my cheeks. . . . I saw that Peter was blinking hard; he too turned his head away.

We felt happy yet at the same time rather sorry to leave the floe we had lived on for so long.

Men carrying banners were coming towards us. I rushed forward to meet them. From two directions the men of the *Taimyr* and the *Murman* were approaching. Among them were comrades with whom I had previously worked at polar stations. They proceeded to embrace

us and toss us in the air in their enthusiasm—they nearly tore my fur waistcoat.

The camp is winding up its existence. We gathered round the radio and signed the last radiogram to Comrade Stalin; which Ernst proceeded to transmit. Again a lump rose in my throat. I turned away quickly.

Sailors, stokers, cameramen, polar workers—all flung themselves on me:

"Dmitrich, let me have your cup!"

"Just autograph this book!"

"Let me have a packet of dried fruit as a memento!" "A tablet of pea soup!" "A tin of tomatoes!"

We dug out the living-tent which was almost completely snowed under. We hauled it down carefully, folded it up and placed it on a sledge.

The floe is now stripped bare.

I bid farewell to the floe, and made my last round of the camp.

I came to the flag-pole from which fluttered Stalin's portrait, which I carefully took down.

I admit it made me sad to leave the icefloe on which we had lived 274 days. It had proved so enduring and hospitable.

Ernst came out of his radio hut. He had just been calling all stations and telling them that radio station "UPOL" had completed its work in the Central Polar Basin.

We demolished the snow walls of the radio station, hauled out the sledges and bid farewell to our camp for the last time.

Now we are on our way to the ships. High on a hummock flutters the flag of the U.S.S.R. I hoisted the flag of our Motherland on a pile of pack-ice, lashed down the flagpole, and was the last man to leave the floe.

We are leaving the flag in memory of our drift. It will go on drifting through the sea until the icefloe melts away.

I turned back, lashed the flagpole still more firmly so that the wind should not blow it down.

Farewell North Pole Station. At last our Stalinist watch out here has come to an end!

I am now on the *Murman*. We drew lots as to which ship we should sail in, and Ernst and I drew the *Murman*. As I sit in this comfortable cabin, writing these last lines, turning over the pages of my diary, I feel as if I am still on the icefloe, that the present is a dream—a sweet and happy dream. . . . But no, this is no dream: I am on board a Soviet ship, among friends, among my beloved Soviet people.

THE END